

DEFENDING AMERICA ISSUE

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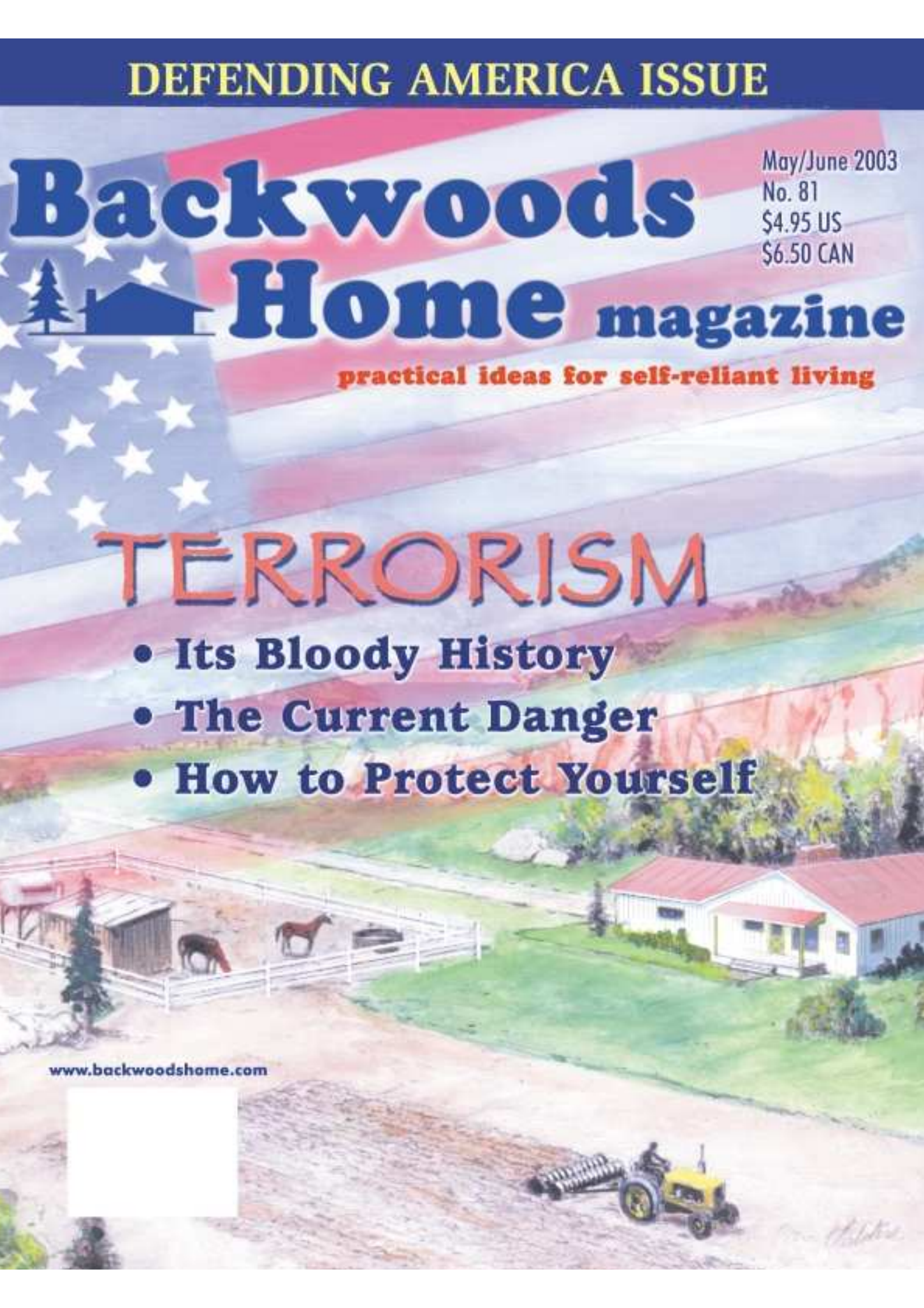
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practical ideas for self-reliant living

TERRORISM

- **Its Bloody History**
- **The Current Danger**
- **How to Protect Yourself**

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Backwoods Home Magazine is written for people who have a desire to pursue personal independence, self sufficiency, and their dreams. It offers "how to" articles on owner-built housing, independent energy, gardening, health, self-employment, country living, and other topics related to an independent and self-reliant lifestyle.

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ABOUT THE COVER

Don Childers is back! We here at *Backwoods Home Magazine* feel he hit a home run with his latest cover. With this issue being filled with the real doom and gloom issues that face us today, we wanted to remind ourselves and our readers of the things worth saving in America. The cover is a scene of the American dream with Old Glory at the forefront. We can only keep them if we prepare ourselves and keep ourselves strong.



FEATURES

Self-reliance

8 What can you do to protect yourself against chemical, biological, and nuclear terrorism By Gary F. Arnet, D.D.S.

Terrorism can come to us in many forms. Dr. Arnet looks at some of the more sinister possibilities: chemical, biological, and nuclear. He explains how they may happen and explains some of the steps we as individuals can take to protect ourselves and our families.



21 Dark Winter — A simulated terrorist attack on three American cities using weaponized smallpox By Dave Duffy

No one knows exactly what the consequences of a biological attack on the United States could be. But the experts have tried creating simulations of such a catastrophe and the results are scary. BHM publisher Dave Duffy has painstakingly distilled the results of the experts' findings for our readers.

28 How safe is smallpox vaccine? By Dave Duffy

Smallpox is a disease that carries a 30% mortality rate, and the scars it leaves on survivors are ugly and lifelong. Vaccines can protect you, but carry their own dangers. Dave Duffy tells you how to assess the risks of vaccination vs. no vaccination and how to make an informed decision whether and when to get one.



44 Traditional trail foods — transportable calories By Brad Rohdenburg

You can spend your money on expensive commercial "trail" foods—or you can make your own traditional trail foods that are less expensive, good tasting, and packed with energy.



47 Preparedness for travelers By Brad Rohdenburg

Disasters don't just happen when you're at home. A survival situation may arise when you're traveling in your car, in a hotel, or at an airport in a Third World country. Brad Rohdenburg tells you what you should do to prepare and protect yourself in many of these situations.

50 Jackie Clay's basic "grab & git" emergency kits By Jackie Clay

Are you ready if disaster strikes? BHM's longtime contributor, Jackie Clay, gives her expert advice on how to put together "grab & git" kits to help you make it through if you have to leave your home in a hurry to weather an unexpected disaster.



68 Chapter 3: Occupational hazard By Robert Waters

Sixty-year-old Ann Barry went to bed at 9:30 and fell into a deep sleep. Later, she heard a thump. She thought she was having a nightmare. But the real nightmare was about to begin. Ann woke to find that all that stood between her and a troop of home invaders was her .357 and her guts. This is Chapter 3 from Robert Waters' new book, *Guns Save Lives*.

72 The West Nile virus threat By Gary F. Arnet, D.D.S.

A new and sometimes deadly disease has reached our shores and it's here to stay. Dr. Arnet explains what this new disease is and the steps you can take to protect yourself.



Farm and garden

60 The home citrus orchard By Anita Evangelista

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Publisher's Note

A gloomy issue for a gloomy time

Gloomy looking issue, isn't it? Looking through it as we go to print, the first 50 pages are full of terrorism, disease, and atrocities committed by man against man. Only a few articles on gardening, no building articles, even the Irreverent Jokes pages have been cut in half. And to top it off we close the issue with an article on the West Nile Virus, which has nothing to do with terrorism but which simply had to go in this issue because of its timeliness.

Such is my apology for bringing you a magazine so full of gloomy subjects. I promise more hopeful topics next issue. But this issue's bad news topics represent our concern that readers should be informed about the bad, as well as the good and productive, when it comes to country living and self-reliance. We always get a few cancellations when we publish unpleasant articles. I suppose that's the price you pay when you publish what the heart tells you needs to be said, rather than just publish what makes people feel good. *BHM* is an optimistic magazine about what a person can do to take control of his life and make something of it, but it is definitely not a feel-good magazine for all occasions.

Redundant preparedness systems

It is impossible to cover the subject of preparing against every possible terrorist threat in a single issue, or in a single book, or even in a number of books. All we can do is point out some of the dangers and suggest some strategies that will work against a variety of disruptions of society. Our *Emergency Preparedness and Survival Guide* book, with its companion CD-ROM, has much more information you will find useful.

Personally I don't tend to prepare against specific threats. I just run my house sensibly, with plenty of food on hand, a reliable water supply, medical kit, redundant light and heat sources, etc. For example I have electric, propane, and wood fuel for heating. I use wood most of the time, but the propane comes in handy if I can't cut wood, as is the case now because I threw my back out a week ago. The electric heat happened to come with the house, but I find the bathroom floor register very cozy on a cold winter morning. And if ever I throw out my back and run out of propane at the same time, I could fall back on the rest of the registers in the house.

My water system is gravity fed from my own spring, so I don't have to rely on electricity to power a pump. Plus I keep an ample quantity of sealed one-gallon water jugs on hand, and have several backup water purifying systems in addition to the main particle filters and ultraviolet light

installed on my water line running to the house. One of my backups is the Berkey advertised on page 3 of this issue. I've had it for several years.

Food is easy. We have lots of it, with cans dated and used on a regular basis so they don't get old. My wife typically cooks from fresh food but she is proficient at utilizing the canned goods. Plus our eight chickens give us an average of 6 eggs a

day, which is a handy source of good protein.

I'm installing a backup heavy duty 1800-rpm propane generator with a 500-gallon propane tank to assure electricity generation should the grid go down. This year I even installed four modern propane lights, hard plumbed to the tank, just in case. They double as romantic dinner lights. Plus I've got some Lehman kerosene lanterns to further the redundancy of my lighting systems. Unfortunately I do not live in a good sun area for solar, but I am still toying with the idea of a wind generator.

And of course I have firearms and plenty of ammo to defend my home against an unruly mob or roving predators, plus I live far away from any city that could have an eruption of chaos during a major terrorist attack.

Unlike the bogus Y2K threat of a few years ago, this terrorist threat is real and will be with us for awhile. I hope this issue helps you understand the threat and that you take appropriate action.

Half price subs to military personnel

To show our support for our troops in this new encounter with Iraq, we are offering any military person a half price subscription to *BHM*. So if you are in the military, or if you want to send a gift subscription to someone in the military, just send in half the normal subscription price—or send an even \$10 if you just want to slip a sawbuck in an envelope and mail it to us. The overseas military person must have an APO or FPO mailing address.

We strongly support our troops. They are brave young soldiers and we pray for their safe return to America. My daughter's husband, U.S. Marine Corps Pfc Erik Tuttle, is one of 26 young people to go the Middle East from our small 2000-person town of Gold Beach, Oregon.

— Dave



Dave Duffy

My view

Confronting the enemy

I got a lot of criticism a couple of issues ago from liberals when I pointed my finger at black Americans and asked why they had their heads screwed on so backwards when it came to politics. Some insinuated I was a racist. What a laugh. You always know a liberal is squirming under the glare of the truth when they lash out that you must be some kind of a racist.

Well now I've actually discovered someone to hate: terrorists. And I'm going to describe how Americans, all Americans, black and white, brown and yellow, are going to root them out from the sewers where they hide, and kill them, one by one, despite the fact that liberal whiners like the United Nations, France, and the Democratic Party will try to block us.

The question of whether or not we can do it should have been settled conclusively with Afghanistan. You know, that "graveyard of empires" as the liberals were calling it when we first went in after the Taliban and bin Laden. It's a quagmire, they insisted. It's hopeless—the mountains, the bitter winters, the lawless tribes, on and on. Yet within a few months the Taliban were gone and Al Qaida was on the run. The Afghan people embraced us as liberators.

And do we have the determination and the will to persevere? Ask the dictator of Iraq and all the third rate has-been powers of the UN who supported him. Ask Cuba's Castro if we have perseverance. And ask their former Soviet friends if we have the will to hold the course until even the most formidable foe is history.

The American species is unique in all of history. Not because of our race—we are a blend of races, after all—but because of our achievements which are a direct result of our freedoms. We are free to do what we want like no race on earth has ever been, and we rule the Earth because of it—economically, militarily, any way you can measure it. We are free, therefore we are powerful. It's a simple equation. We taught it to the European powers like France and Germany after World War II, but they have forgotten freedom in their late love affair with socialism. We haven't, and we'll pursue terrorists to the ends of the earth because we have no intention of giving freedom up.

Every step of the way the Ted Kennedys and Dianne Feinsteins of the world will say we are engaging in racial profiling, or we are flailing around like an out of control brat beating smaller countries over the head with our power. The United Nations with its assortment of dictatorships and socialist regimes will complain we are acting outside of international law. So what. If it were up to them, every Arab muslim terrorist in Guantanamo Bay would

have an American tax payer-paid high priced New York lawyer defending him.

America won't listen to the naysayers in this war.

The naysayers will say we haven't proven countries like Iraq guilty of anything, and besides their people will suffer if we act against them. But we will crush them like the cockroaches they are if our intelligence shows they are working with or selling weapons to terrorists who target the U.S. We'll spare their innocent civilians if we can, but not at the expense of American freedom fighters.

They'll tell us that countries like North Korea are poor and need to be negotiated with and helped financially so that they give up their nuclear arms and their reckless behavior. If we determine they pose mainly a danger to their part of the world, we will ignore them and tell their neighbors to solve the problem, but if we determine they are supplying arms to terrorists who target the U.S., we will destroy them too.

And they will tell us that Islam is a peaceful religion despite the fact that nearly all terrorists who have targeted the U.S. have been militant Islamists. But if we find, as we well may, that there is a profound Islamist element to the terrorists' actions, that a certain percentage of Mohammed's followers take seriously his commandment to conquer the world by the sword if necessary, then we will hunt these Islamists down by the hundreds until Islam's leaders, especially those in America, condemn this antiquated commandment and put a stop to the religious aspect of terrorism.

At home in America, the ultra liberals in the Democratic Party, and the leftists and socialists on our college campuses, will tell us to stop, stop, stop the hunting down and killing of terrorists because we might be violating someone's rights. And we might be on occasion, but that won't stop our slaughter of terrorists. They picked this fight with us, and just like we did with the Japanese and Germans of World War II, we'll finish it, while frail and afraid countries like France lie in the mud with their shame and lack of action.

Make no mistake about it. This is a war about America's freedoms. The terrorists may not see it that way, but Americans do. And we will kill anyone to keep our freedoms, to keep our streets free to walk without fear of being blown up by some slimeball, to keep our neighborhoods free from the fear that some piece of human trash may try to inflict death on us with chemicals or disease.

If terrorists wanted a fight to the death, they picked the perfect country. We're going to take you one by one as you ooze out of your sewers and crush you into the slime you are. And when you're too much of a coward to come out of your sewer, we'll make the sewer and everything in it your grave.

Now how's that for racism!

— Dave Duffy

What can you do to **PROTECT YOURSELF** against chemical, biological, and nuclear terrorism

By Gary F. Arnet, D.D.S.

"DUE TO RECENT INFORMATION WE HAVE OBTAINED, THE STATE OF ALERT IN THE NATION IS BEING RAISED TO CODE ORANGE. TAKE APPROPRIATE ACTION. EVERYONE SHOULD HAVE PLASTIC SHEETING AND DUCT TAPE." — HOMELAND SECURITY SECRETARY TOM RIDGE

Television news programs showed lines of people swarming stores buying up every roll of duct tape, every roll of plastic sheeting, and leaving with armfuls of gas masks. Bottled water, food, and other needed supplies flew off the store shelves. This was followed by scenes of people sealing up rooms with plastic and even wrapping the entire outside of their house in sheets of plastic.

Homeland Security Secretary Tom Ridge is now warning people to be prepared for terrorist attacks. "Make a kit, have a plan, get informed," he says. This is good advice. Despite years of previous warnings to prepare for natural disasters, this recent panic proved people had not stored emergency supplies, creating predictable chaos when they were needed. If this had been a terrorist attack, instead of a warning, things would have been even worse. Even when they had supplies, people didn't know what to do with them.

Weapons of mass destruction are chemical, biological, or nuclear weapons developed by countries for war, but now being sought by terrorists for use against civilian popula-

tions. Some in the government agree that their future use against the civilian population within the borders of the United States is almost guaranteed.

Despite the horror this will cause, it is possible to protect yourself and your family from the effects of many of these attacks by using common sense, avoiding panic, becoming informed, and preparing ahead of

time. This article is intended to help you start doing just that.

Chemical terrorism

NATO defines a chemical weapon as a chemical substance intended for military use to kill, injure, or incapacitate people. Not only do they cause death and injury, they can have devastating psychological effects, crippling not only the affected population, but the nation in general. Depending on



Chemical protection masks (gas masks) have been issued to 23,000 workers at the Pentagon and to Israeli citizens. Most Americans will probably not need them, but those who may live or work in areas that could be targets of chemical attack may want to obtain their own.

the chemical used, the weapon will affect the nervous system, lungs, skin, eyes, nose, throat, or a combination of these.

Relatively inexpensive to produce or obtain, it is fairly certain that terrorists have access to such chemical weapons which they would use against civilian populations without hesitation. This was proven on March 20, 1995, when the Aum Shinrikyo religious cult attacked the Tokyo subway with sarin nerve gas, killing 12 and injuring more than 5,000.

Unfortunately, chemical attacks against a civilian population is a reality today. Israeli civilians have been living with this possibility for some time. Civilians are issued gas masks and chemical "safe rooms" are being built in new homes. American civilians must be prepared also.

Just as we could not believe that terrorists would fly airplanes into buildings, we cannot begin to think of all the ways terrorists might use chemical weapons. Logic says that confined areas with large numbers of people would be likely targets. Subways, tunnels, office buildings, hotels, apartment building, and airports seem to be potential targets.

However, nothing is to stop terrorists from spraying football stadiums, parades, or any other large gathering of people with chemicals from aircraft or chemicals released upwind. For military applications, chemical weapons are also dispersed via missile, rocket, bombs, artillery shell, and land mines and it is possible these could be obtained for use against civilians.

To understand the actions to take during a chemical attack, it is important to first understand the chemicals and their effects. Thousands of poisonous chemicals are known, but only a few are suitable as weapons and have been stockpiled for war. While about 70 different chemicals have been produced as weapons, two main types of chemical agents are currently

available, poison gases, and nerve agents.

Mustard gas is felt by experts to be the most likely gas used in a terrorist attack, although Iraq also has cyanide gas weapons. Germany introduced and effectively used mustard gas during World War I, causing thousands of casualties. Since then, it has been used many times, including by Iraq against the Iranians and Kurds in the 1980s. It is widely available in Third World countries and former Warsaw Pact countries. The United States still has a stockpile in its arsenal that is awaiting destruction.

The population downwind of a chemical attack may be advised to "shelter in place" by authorities. If so, go indoors and create a "safe room" that is isolated from outside air. Turn off air conditioning, heaters, and fans that can draw outside air into the room. This would be the time to use plastic sheeting and duct tape to seal cracks around the door, air ducts, and any vents into the room.

In a class called vesicants, mustard gas does not immediately kill people, rather taking hours for symptoms to develop. Vapors of mustard gas penetrate most fabrics quickly and the chemical is absorbed into the skin. A sunburn appearance of the skin develops within 2 to 48 hours, with itching and stinging pain often present. After this, small blisters on the skin can form, eventually enlarging into very large blisters called bullae. Eyes can develop a mild inflammation (conjunctivitis) or severe ulcerations of the cornea, causing blindness. Death from mustard gas is most often from inhaling the gas. Irritation of the

nose, throat, and sinuses is the first sign of inhaled gas, followed by laryngitis, nose bleeds, and a cough. The cough worsens as damage to the lower lungs leads to respiratory failure and death.

The Germans used cyanide gas during World War II in their gas chambers and it was used by Iraq against the Kurds in the 1980s. Deadly when used in enclosed spaces, cyanide gas is lighter than air and rapidly dissipates outdoors. It causes death by starving the body's cells of oxygen, being especially toxic to heart and brain cells.

Nerve agents are some of the most potent chemicals known to man and are a more likely terrorist threat than poison gases, often killing the victim within minutes of exposure. German scientists developing pesticides in the 1930s observed that chemicals called organo-phosphate compounds affect transmission of nerve impulses and kill humans rapidly. Although 12,000 tons of chemical weapons were made for the German military during World War II, they were not used on the battlefield. Although many countries have the ability to produce nerve agents, the only time they have been used in war so far was by the Iraqis in the Iraq/Iran war.

Early types of organo-phosphate weapons are classified in American nomenclature as "G agents" and include tabun (GA), sarin (GB), soman (GD), and cyclohexyl methylphosphonofluoridate (GF). In the 1950s, while researching insecticides, the most toxic nerve agents ever known to man were developed by American and European scientists. Called "V agents," they are 10 times more deadly than sarin. VX is the most common V agent.

Nerve agents are all colorless liquids. Sarin easily vaporizes and may be inhaled into the lungs as well as absorbed through the skin. An area contaminated by sarin decontaminates itself within a few days because

of this easy vaporization. VX is more of a thick oil that does not vaporize as rapidly and is, therefore, mostly absorbed through the skin. VX may remain on the ground for several weeks. The effectiveness of tabun, soman, and GF contamination are somewhere between those of sarin and VX.

Nerve agents kill people by inhibiting acetylcholinesterase, an enzyme in the body that stops conduction of nerve impulses. When a nerve impulse gets to a junction, called a synapse, a chemical called acetylcholine allows the impulse to move to the next nerve cell. Acetylcholinesterase then degrades the acetylcholine so the nerve impulse will stop. When nerve agents block acetylcholinesterase, the muscles of the body continue to be stimulated by acetylcholine until they fatigue and breathing muscles no longer function.

The effects of exposure to a nerve agent depend on the dose and route of exposure. When exposed to a low dose, symptoms may include a runny nose, excess saliva, constriction of the pupils of the eyes, headache, or tightness of the chest. Slurred speech, tiredness, nausea, and hallucinations may occur.

Exposure to high doses of nerve agent, especially when inhaled, lead to muscle twitching, convulsions, and loss of consciousness. In large exposures, this may happen so quickly that symptoms previously mentioned may not have time to develop. Paralysis of the muscles of respiration and effects on the breathing centers of the brain cause death by suffocation. High doses of inhaled agent can cause death in two minutes, while exposure through the skin only takes longer for symptoms to develop.

Protection from chemical attack

We have all seen news photos of our soldiers in chemical protection

gear, but what can we as civilians do? First, remember that an attack anywhere in the United States will bring nationwide panic, which is one of the goals of the terrorists. An attack in one city will be a local disaster, however, affecting only those in immediate contact with the chemical agent. If it is an airborne attack where wind could spread the agent, there could be an effect to the downwind population.

Signs of a possible chemical attack include many people suffering from watery eyes, coughing, choking, twitching, or having trouble breathing. Large numbers of dead or sick birds, fish, and small animals may be present.

There are three main ways to protect against chemical weapons: physical protection, medical protection, and decontamination. At the first sign of a chemical attack, quickly determine where the chemical is coming from and get away. When the chemical is in the building in which you are located, leave the building without passing through the contaminated area. If you can't get out, get as far away from the chemical release as possible.

Physical protection involves protection of the body and respiratory system. Military and front-line civil-defense rescue units who will need to be in the contaminated area will have full body suits and respirators that are not going to be available to the civilian population.

Civilian exposure to chemical agents will be mostly during the time that they are evacuating the attacked area. When doing so, individuals should make sure all areas of their skin are covered and they are wearing a protective mask.

Protective masks provide barriers preventing the chemical agent from being inhaled through the nose or mouth. While useful in chemical attacks, they are also useful in biological attacks and after major explosions that release fine dust and debris



Surgical or dust masks prevent inhalation of biological agents or fine dust and debris caused by explosions that can damage the lungs, but will not adequately protect against chemical agents.

that can damage the lungs, such as the September 11 attacks on the Trade Center. They may also protect against smoke and chemicals released from attacks using conventional explosives on oil refinery or other industrial targets.

Surgical masks or masks made of dense-weave cotton that tightly cover the nose and mouth work to prevent inhalation of biological agents or dust, but will not adequately protect against chemical agents. Still, they are better than nothing in a chemical attack.

Protective chemical masks (gas masks), such as those issued to the Israeli civilian population, are available for adults and older children. In February, 23,000 workers at the Pentagon were issued chemical masks by the Department of Defense, so the government is taking the threat seriously.

Protective masks are not something that we can expect the government to be able to provide in an emergency. Those individuals who live or work in an area where a chemical attack is a possibility might want to have their own mask. For most people, they probably are not necessary. To be



Potassium iodide is useful in preventing thyroid cancer from radioactive fallout. The National Pharmaceutical Stockpile program has large amounts stored, but many individuals prefer to have their own supply, which is inexpensive to purchase and does not need a prescription.

effective, they would need to be immediately accessible at all times.

Protective masks are available through stores that sell emergency preparedness or industrial safety supplies, as well as some military surplus stores. Since your life depends on it, purchase a new one designed for this



Antibiotics are used to treat bacterial infections caused by biological weapons and are being acquired by the National Pharmaceutical Stockpile program for use throughout the country. Authorities do not recommend that individual store antibiotics, although some are doing so with the help of their physicians.

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purpose, not a used "army gas mask." Costs vary, but expect to pay as much as \$190 for a good quality mask.

The population downwind of a chemical attack may be advised to "shelter in place" by authorities. If so, go indoors and create a "safe room" that is isolated from outside air. Turn off air conditioning, heaters, and fans that can draw outside air into the room. This would be the time to use plastic sheeting and duct tape to seal cracks around the door, air ducts, and any vents into the room.

Since some chemicals are heavier than air, they may seep into basements even if windows are closed, so a room above ground level is best. Listen to information provided by authorities over radio or television. Further actions depend on the type of chemical weapons used.

Medical protection

Since nerve agents work very rapidly, any medical treatment must be immediately available. The military provides kits with auto-injectors of antidote to those personnel at high risk of exposure to nerve agents. While these are not available to civilians and are reportedly not on the surplus market, these antidotes are standard pharmaceutical drugs. It may be possible to obtain them through a friendly physician or pharmacist if you believe you are at high-risk for exposure to chemical attack. For most of us, this is probably not the case.

Atropine is an anticholinergic compound that reduces the effect of excess acetylcholine and should be injected when exposure to nerve agent has occurred or is imminent. Pralidoxime chloride (Protopam chloride or 2-PAM), restores normal activity of acetylcholinesterase, blocking the effects of the nerve agent. Each combat soldier in the military is issued three MARK I kits, each containing an auto-injector with 2mg of atropine and 600 mg of pralidoxime chloride.

Diazepam (Valium) is an anti-seizure drug that is used as a pre-treatment drug or at the onset of severe symptoms from a nerve agent. As a pre-treatment, it is taken when an exposure is expected. A tablet is taken at least 30 minutes prior to exposure, with the best effect two hours later. Treatment can be repeated every eight hours for several days, if necessary. U.S. soldiers carry an auto-injector containing 10 mg of diazepam to be injected in case of severe nerve agent symptoms.

Decontamination

Once exposed to a chemical, rapid decontamination is important before it can be absorbed through the skin. Because decontamination works best within the first few minutes after exposure to chemical agents, self-decontamination is a priority. Strip off any contaminated clothing and wash with any source of water, using soap if available.

Flush contaminated skin with large amounts of water to remove or dilute the chemical agent. A wooden stick can be used to scrape off chemical agents, as can absorbent materials such as dry powders, soil, flour, and soap detergents. It is reported that applying flour and wiping with tissue paper is particularly effective in removing VX and soman, although all methods work for all agents. You don't need to know what you are dealing with to decontaminate.

Soap and water hydrolyze and inactivate VX and nerve agents, while chlorine can be used to oxidize mustard gas. The military recommends using a 0.5% solution of sodium or calcium hypochlorite solution (diluted bleach) for skin and a 5% solution for equipment. Household bleach is generally 4-6% chlorine and can be diluted for use.

Biological terrorism

Biological weapons are bacteria, viruses, and toxins that cause disease

in humans, livestock, or crops. Attractive to terrorists because they are relatively inexpensive compared to nuclear, chemical, or conventional weapons, they can be manufactured with readily available scientific equipment and biological cultures.

Projections on the casualty rate from bioweapons are staggering. A government study estimated if 200 pounds of aerosolized anthrax was released over Washington D.C., there would be up to 3 million deaths. Smallpox killed over 500 million people in the world during the 20th century before it was eradicated in 1977.

Should potassium iodide be needed on a large scale in the United States, it is likely that enough would not be available. Since it is cheap, safe, and does not require a prescription, it may be a wise idea to have some available as part of a disaster preparedness plan.

Biological agents are odorless, colorless, and tasteless, and can be distributed by crop duster aircraft, boats, or trucks. With low wind speeds and inversion conditions, they can be sprayed upwind of the intended target, increasing the number of casualties.

Bioweapons must be inhaled, eaten, or enter through a cut in the skin. Some, like smallpox, are contagious and are spread from person to person, while others, like anthrax, are not contagious. Terrorists would likely prefer inhaled agents, since they can be spread rapidly and a large number of individuals can be infected before anyone is aware of the attack.

Of twelve different agents mentioned repeatedly in biological warfare literature, six are considered

most likely to be used: anthrax, smallpox, botulism toxin, plague, tularemia, and hemorrhagic fevers such as Ebola. Anthrax and botulism toxin have already been weaponized and are likely to be available to terrorists.

Smallpox is highly contagious and can be easily made in large quantities. The secret Soviet program of the Cold War reportedly made tons of weaponized smallpox. Since a good portion of the population has never been vaccinated, it is considered an ideal terrorist weapon.

Ricin is also something that has been in the news lately, having been found in an apartment in London.

Volumes of information have been written about all known biological warfare agents and detailed information can be found on the Internet and in medical books. Since the precautions we can take are the same no matter the biological agent, I will review only the few most likely agents.

Anthrax is a bacterial infection that causes diseases that affect the skin, gastrointestinal system, or respiratory system (inhalational anthrax). Inhalational anthrax is most severe and begins 3 to 5 days after inhaling anthrax spores. Respiratory symptoms begin slowly and then rapidly progress to shortness of breath and lack of oxygenation of the blood. Shock and death occur within 2 to 3 days after respiratory distress begins. Treatment with antibiotics is usually not effective once symptoms begin.

If exposure has occurred or is imminent, antibiotics are advised. Cipro 500 mg twice a day or doxycycline 100 mg twice a day are used. Vaccine is given to those not previously vaccinated.

Botulism toxin (Botox) is produced by *Clostridium botulinum* bacteria. It is the strongest toxin known, being 100,000 times stronger than sarin nerve gas. Working by blocking nerve transmissions, botulism toxin causes



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muscle paralysis and respiratory failure. Symptoms may appear 2 to 3 days after exposure and death occurs in as little as 24 hours after the first symptoms.

No medicines are available to reverse this toxin and extensive hospital care is required which could take weeks or months. While this was fatal 60% of the time in the 1950s, medical care today has reduced the death rate to less than 5%. However, it should be expected the death rate would increase after a terrorist attack, as it would be difficult for hospitals to provide intensive care for hundreds of victims who might become simultaneously infected.

Smallpox is a virus that was eradicated from the world in 1977. Only two secure facilities in the world were supposed to have stored virus samples in case it was needed for a vaccine. One was in the United States and one in the Soviet Union. It is known the Soviet Union did research to weaponize smallpox, and to combine smallpox and Ebola viruses to make a weapon. A 1998 intelligence report concluded that smallpox for military use was possessed by Iraq, North Korea, and Russia.

Spread by coughing, sneezing, or dust on clothing and bedding, smallpox is highly contagious. After an incubation period of 12 days, fever,

vomiting, and headache begin, followed by rashes and blisters of the skin. Smallpox kills about 30% of its victims and scars and sometimes blinds the survivors..

A smallpox vaccine recently has become available for first responders and health care workers, and will be offered to the public in the future. Vaccination after exposure will protect if it is taken within four days..

Ricin is a deadly poison in the form of a powder, mist, or pellet that can be made by amateurs from the waste of castor beans. It was found recently in Afghanistan while searching Al-Qaeda caves and is suspected of being used in the Iran/Iraq war. Within hours of exposure, the victim starts coughing and their lungs fill with fluid. There is no antidote and treatment is aimed at supporting respiration until the victim recovers or dies. Death occurs within 3 to 4 days of exposure.

Protection from biological attack

A biological attack may not be immediately obvious, as biological agents cannot be detected until people become sick. Usually, hospitals will notice an unusual pattern of disease or there will be a large number of people seeking help.

Once a biological attack is suspected, local public health officials will notify the public via radio, television, and, possibly, door-to-door advising the public what steps to take. Expect mandatory quarantines of infected victims, possibly the entire civilian population.

Travel may be stopped with any

significant biological attack on the United States. Long-term disruptions to the infrastructure of the country could affect the economy and food supply. This is another reason to consider a long-term preparedness plan, with three months to a year supply of food, water, and essentials.

It doesn't hurt to protect yourself if you become aware of a suspicious release of an unknown substance. Move away rapidly while covering the nose and mouth with a cotton filter, such as a handkerchief, towel, or T-shirt. Once safe, wash with soap and water, and contact authorities.

If a biological emergency is declared for a contagious disease, such as smallpox, follow health department instructions, use common sense, and practice good hygiene to avoid spreading the disease. If you have Internet access, www.cdc.gov has extensive descriptions of possible terrorist agents and decontamination procedures. Depending on the severity, this might be a good time to consider a self-imposed quarantine, avoiding contact with others. Definitely, it would be a time to wear a mask when in public. If a family member becomes sick, be suspicious, but do not automatically assume it is a result of the attack since symptoms of many common illnesses overlap with symptoms of biological weapons.

The National Pharmaceutical Stockpile program has stockpiled antibiotics, vaccines, and medical supplies that can be rapidly sent anywhere in the country for use in biological attacks. If antibiotics or vaccines are recommended, public health officials will give information about who should get them and where they are being offered.

Nuclear terrorism

A nuclear disaster, called a "nuclear emergency" by government agencies, is any accidental or intentional large-scale release of radioactive material.



Many disaster preparedness experts suggest having enough food and water to last several weeks or more. Foods stored can be a combination of everyday foods that are rotated every six months and foods designed to be stored for years.

This could occur from any number of terrorist attacks in the United States or from fallout from a nuclear war in Iraq, Korea, or between India and Pakistan.

A relatively small nuclear bomb detonated in New York City could kill over 100,000 people and spread radiation over much of the east coast. Authorities worry that nuclear weapons could be bought, stolen, or built by terrorists or obtained by the fall of a nuclear power, such as Pakistan. Nuclear bombs, missiles, and "suitcase" bombs are all in demand by terrorists and Third World countries.

Nuclear power plants are also potential terrorist targets. An attack on one of the 103 nuclear power plants in the United States using a commercial jet or large bomb would have some of the same effects as the detonation of a nuclear weapon. A meltdown of the core or dispersal of spent fuel waste would spread radiation in lethal doses over large areas.

Nuclear waste material is transported by ship, truck, and rail throughout the United States. Radioactive waste from Asia actually is transported by rail through heavily populated areas of California to be stored in the West. Terrorist attacks against such largely unguarded rail transportation could spread radiation locally.

"Dirty" bombs are the most accessible radiological weapons available to terrorists. Islamic terrorists placed, but did not detonate, such a weapon in a Moscow park in 1996.

Relatively easy to make, "dirty" bombs are conventional explosives wrapped with radioactive waste material. Upon detonation, radiation is scattered widely. Cars, trucks, or shipping containers can easily hide such a bomb. It is estimated that forty percent of the inbound shipping into the United States could be affected if such a bomb were detonated at a major shipping port.

A nuclear disaster brought about the detonation of an actual atomic bomb would affect us in three ways. First, the population in the immediate area affected by the thermal effects (fireball), shock wave, and intense radiation would have to deal with death, injuries, and radioactivity.

Second, those living downwind would have to deal with radioactive fallout. Fallout is radiation that is scattered into the atmosphere and carried by the wind until it settles to the ground or is washed to the ground by rain or snow. Plant crops and animals used for food are contaminated and unusable, as are exposed sources of drinking water.

Third, there would be general panic throughout the United States and possible disruption of transportation, food, and supplies. Everyone, whether or not affected by radiation, will be affected by a major nuclear disaster in the United States. Understanding the effects of a nuclear explosion allows us to develop a rational plan of what to do if faced with a nuclear disaster.

Detonation of a nuclear weapon would cause a fireball of blinding light and heat, causing blindness, burns, and death. Everything nearby would catch fire and burn. Superheated air would cause a shock wave with winds traveling at supersonic speeds and blowing over every building, train, vehicle, or person in their path. Such winds travel several hundred miles per hour and cause damage over a mile away.

Severe radiation will cause immediate death and injury to those in the



Red Cross and government agencies recommend everyone have food, water, and supplies to take care of themselves for at least 72 hours. A "72 hour kit" should be able to be easily loaded into a car in case evacuation is necessary during a terrorist attack or natural disaster.

area of detonation and radiation sickness to those somewhat further away. Radiation sickness can cause hair to fall out, nausea, vomiting, diarrhea, bleeding, or infection. An individual can be shielded from the initial radiation blast by being sheltered by a concrete or dirt structure. Nuclear weapons also produce an electromagnetic pulse, causing localized disruption of electrical equipment, communications, and computers, but not injuring humans.

Fallout is the least serious consequence of a nuclear explosion, however it affects many more people than the initial blast since, depending on the winds, it can travel hundreds or thousands of miles. It causes deaths in the future due to cancer or birth defects.

Radiation exposure from fallout is either external or internal. External exposure occurs when radioactive material contaminates the skin or clothing and internal exposure occurs when radioactive material is swallowed, inhaled, or absorbed through open wounds. Most of the victims from the Chernobyl accident received internal radiation from drinking milk produced by cows that ate contaminated grass.

The human body normally produces hormones in the thyroid gland from iodine in our diet. One of the byproducts of a nuclear explosion is a form of radioactive iodine that is also absorbed and can cause cancer of the thyroid gland, especially in children, years later. Thousands of cases were reported after Chernobyl.

Time, distance, and shielding are factors that minimize exposure to radiation. Most radioactive fallout loses its strength rapidly and the farther from the source of radiation, the less radiation exposure. Concrete, dirt, and other dense building materials will block out radiation. For radioactive fallout, staying indoors may be all the shielding needed.

Protection from nuclear attack

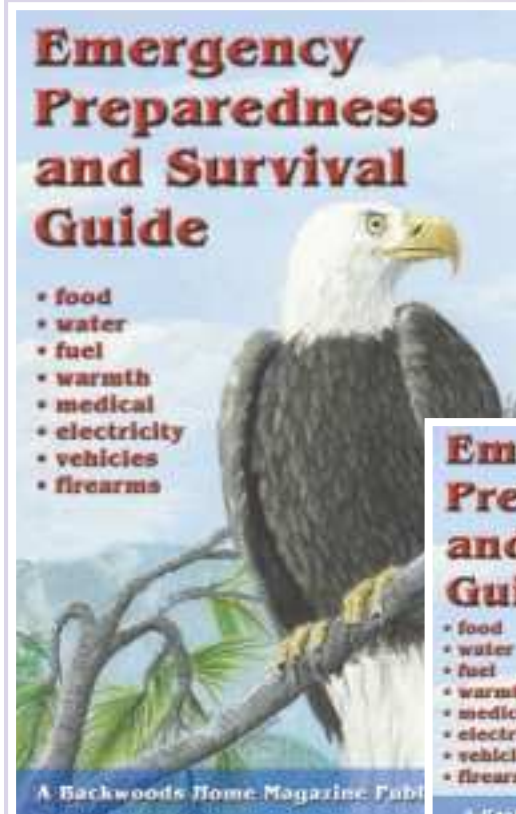
Depending on the amount of notice that you have and the distance from the nuclear disaster, you will either need to stay put in a sheltered place or evacuate.

In the case of nuclear power plant disasters, the Federal Emergency Management Agency (FEMA) has plans in place and residents within 10 miles of nuclear power plants are given information on what to do in such an emergency.

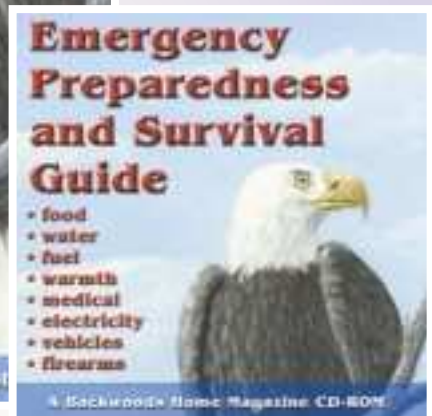
After a nuclear device explodes, move quickly away from the explosion site, going home or to a protected indoor site. If you are advised to "shelter in place" by authorities, go indoors and bring pets with you. Protect the inside of your home or business from fallout by turning off air conditioning, heating, vents, and fans, closing and locking windows and doors, and closing fire place dampers.

Cover air conditioners and vents with plastic, aluminum foil, or waxed paper taped in place to prevent radioactive dust from entering the room. Cracks around windows or doorways should be closed with duct tape or wet towels. Fill sinks, bath-

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tubs, and containers with water and shut pipes off as a protection in case reservoirs become contaminated. If possible, go to a basement or other underground area, as these areas would give more protection from radiation.

When coming inside after exposure to fallout, remove clothes and shoes worn outside, place them in a sealed plastic bag, shower, and put on clean clothes and shoes. Stay indoors until authorities report that the level of radiation outside has subsided enough to be safe.

When going outdoors after it is safe, remember that fruits and vegetables in home gardens will be contaminated. Safety information on eating farm and home garden products should be provided by public health authorities, but, if you must use home grown products that have been exposed to radiation, wash and peel vegetables and fruits.

Use water that has been stored, or comes from underground sources, such as a well. Make sure water from exposed sources, such as rivers, open reservoirs, or lakes, is deemed safe by authorities before drinking. Normally, collecting rainwater is a pure source of drinkable water during a survival situation, but in this case rain may wash radioactive particles out of the atmosphere.

Potassium iodide is used to prevent thyroid cancer after exposure to radioactive fallout. It blocks the radioactive form of iodine from being absorbed by the gland by filling up the thyroid gland with normal iodine. It prevents only thyroid cancer, not the other effects of radiation.

After the Chernobyl accident, thousands of cases of thyroid cancer occurred years later in children in Russia, which did not give its population potassium iodide. Poland was also subjected to radioactive fallout but gave potassium iodide to over 17 million people and did not suffer increases in cancer rates.

During the Three Mile Island crisis, the U.S. government found itself without potassium iodide for the population and scrambled to find some from manufacturers. It turned out that it was not needed for that incident and the stockpile was discarded when it became old.

On September 11, although it wasn't needed, it turns out that the U.S. government again had no stockpile. Since then, the National Pharmaceutical Stockpile program has purchased large quantities of potassium iodide and people who live near some nuclear power plants have been issued pills to have available.

Should potassium iodide be needed on a large scale in the United States, it is likely that enough would not be available. Since it is cheap, safe, and does not require a prescription, it may be a wise idea to have some available as part of a disaster preparedness plan.

The FDA recommends adults and children over one year of age take one 130 mg tablet per day for 10 days. One-half tablet (65 mg) is the dose for children under one year of age. Individuals allergic to iodide should not take this product as it can cause severe allergic reactions. If you are considering having potassium iodide as part of your survival kit, you should talk to your physician to make sure it is safe for you and check the FDA web site for additional information. It is widely available over the Internet or through your pharmacy.

Radiation monitors are available to test for the presence of radiation. It is questionable if they are necessary or worth the cost. A nuclear disaster today is likely to be localized in one or several parts of the country and nuclear response teams will be equipped to monitor the environment. Waiting in a sheltered place until local authorities report it is safe is probably the best thing to do. Still, for those interested, information and

radiation monitors are available through the Internet or surplus stores.

Preparation

The current government buzzword for "hunkering down" in your house or place of work after a chemical, biological, or nuclear attack is "Shelter in place." Basic preparations are the same for any terrorist act, as well as any natural disaster.

FEMA and the Department of Homeland Security advise people to have enough food, water, and supplies on hand to take care of their family for three days "until help from the government can arrive." Preparing the "72-hour kit" that they recommend is a good idea and can be used for immediate evacuation or as part of your overall home disaster supply kit.

However, in a major terrorist attack or disaster it is unlikely that government relief agencies will be able to help everyone within three days. They will be overwhelmed by disaster and the massive job of caring for the number of people who failed to prepare ahead of time.

It is not unreasonable to expect to have to take care of yourself for several weeks or longer. Some scenarios in which the economy or infrastructure is damaged by biological or nuclear terrorism suggest the need to care for your own needs for a year or longer. Be prepared by storing needed water, food, first aid materials, tools, emergency supplies, and special needs items.

One can live a while without food and comfort items, but cannot live long without water. The body needs at least two quarts of water per day to avoid dehydration, with exercise, hard work, and hot weather increasing the need to as much as four to five quarts per day.

It is recommended that at least a gallon of water per person per day (two quarts for drinking and two for food preparation and sanitation) be stored in food-grade plastic contain-

ers. Plastic water containers, empty two-liter soda bottles, or thirty to fifty gallon containers all work well. Two-gallon bottles of water available at markets are a convenient size to move and use. Water supplies should be rotated every six months to maintain freshness.

Non-perishable foods requiring minimal water to prepare, no refrigeration, and no cooking are ideal for part of your food supply. It is good to have a variety of ready-to-eat canned foods including canned meat, tuna, chicken, stews, beans, fruits, and vegetables, along with canned juices, milk, and soups. Canned foods don't require cooking and can be eaten unheated right out of the can, if necessary. Have a mechanical-type can-opener available in case there is no electricity to run electric ones.

Peanut butter, crackers, granola bars, trail mix, or energy bars are easy to store and are high-energy foods. Cookies, hard candy, coffee, or tea are nice comfort foods that will help brighten spirits in stressful times.

A good way to start out buying a supply of emergency food is to visit a large warehouse distributor, such as Costco or Sam's Warehouse, or some of the suppliers who advertise in this magazine. By buying in bulk, a large quantity of food can be purchased at a great discount. At Costco, a 25-lb. bag of rice sells for as little as \$3 and a 25-lb. bag of pinto beans for \$7. So, while it may get boring eating only beans and rice, you can feed a family for a long time during an emergency for only \$10.

Stored food should be rotated every six months. To keep costs down and food fresh, store foods that you normally would buy and use these food supplies for your regular meals. Replace food used with newly purchased food.

Emergency foods packaged to last for 5 to 10 years are available from many sources. Their advantage is you

don't need to remember to rotate food on a regular basis, they are convenient in evacuation situations, and they can be stored in a vehicle. Military MREs (Meals Ready To Eat) have a long shelf life, although they are expensive. Emergency Essentials (ad on page 15), Ready Reserve Foods, and Maple Leaf are among suppliers of #10 size cans of food intended for long-term storage. Their huge selection of foods would allow tasty, complete meals that could be stored for years.

Other emergency supplies should include a first aid kit, battery-operated radio, flashlight with extra batteries, non-electric can opener, matches, lantern, portable cooking stove and fuel, fire extinguisher, hand tools for repairs and to turn off household water and gas, a good knife, and, of course, the recommended plastic sheeting and duct tape to seal doors and vents.

Remember to include toilet paper, towelettes, soap, toothpaste, personal hygiene items, disinfectant, household chlorine bleach to purify water, and other sanitation items. These things will normally be in your home, but make sure you have a supply that will last at least two weeks. Don't forget formula and diapers for infants, prescription medications, contact lenses and supplies, extra glasses, and pet food.

Be prepared

The world is a new place. Terrorists today have the means, power, and desire to attack civilian populations with no hesitation. Who would have believed that we would be facing weapons of mass destruction on our own soil?

Terrorist attacks using weapons of mass destruction could be minor, causing fear and a few injuries, or could be devastating, killing hundreds of thousands and crippling our country. Whatever the case, there will be widespread panic and chaos. Now is

the time to become informed about the possible threats, develop a plan for each threat, and prepare by storing the food, water, and emergency supplies that would be needed.

While future terrorist attacks are almost certain, it is possible to protect yourself against chemical, biological, and nuclear terrorism. Δ

For more information

American Red Cross

www.redcross.org

Department of Homeland Security

www.whitehouse.gov/deptofhomeland/

Federal Emergency Management Agency

www.fema.gov

Centers for Disease Control

www.bt.cdc.gov

National Library of Medicine

www.Sis.nlm.nih.gov/Tox/biologicalwarfare.htm

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DARK WINTER

A simulated terrorist attack on three American cities using weaponized smallpox

By Dave Duffy

Historically smallpox has been the most deadly of all diseases for humans, killing between 300 and 500 million in the last century alone, far more than the 111 million people killed in all that century's wars combined. It is easily spread, kills 30% of those infected, and terribly scars and sometimes blinds those who survive. It was declared eradicated from Earth in 1980, but the Soviet Union has acknowledged maintaining a secret biological weapons program since then that employed 60,000 technicians and scientists. One fear is that some of the smallpox the Soviets worked with has gotten into terrorist hands, or that unemployed Soviet scientists desperate for money have been hired by Iraq, Al Qaida, or other terrorists.

June 22-23, 2001, nearly three months before the attack that toppled New York's World Trade towers, the United States conducted a major simulation of a terrorist smallpox attack against three American cities. It was named *Dark Winter*, and it lived up to its name. Within seven weeks, one million Americans were dead and the disease had spread to 25 states and 13 foreign countries. In the face of the out of control epidemic, panic had spread across America, interrupting vital services such as food deliveries to supermarkets, and our Government considered the possibility of a nuclear response, although against whom it was not clear.

Following is a reenactment of that exercise, edited for brevity but containing all the essential elements. The exercise took place at Andrews Air Force Base in Maryland, and was attended by many senior level government officials. Participating institutions included the *Johns Hopkins Center for Civilian Biodefense Strategies*, the *Center for Strategic and International Studies*, the *Oklahoma National Memorial Institute for the Prevention of Terrorism*, and the *Analytic Services Institute for Homeland Security*.

Former U.S. Senator Sam Nunn of Georgia played the President of the United States, Governor Frank Keating of Oklahoma played himself, five senior journalists who worked for major news organizations participated in mock news briefings, and a number of other participants played various key government positions ranging from the Director of Central Intelligence to key Government health advisors.



An Iranian citizen with smallpox in 1962

Fifty people connected with U.S. bioterrorism policy preparedness observed the exercise.

The goal of the exercise was to increase awareness among Government officials of the danger of such an attack, and to examine the decision challenges the highest levels of Government would face if confronted with a biological attack. The ultimate aim was to improve strategies of response.

Smallpox was chosen as the disease because historically it has been the most feared and deadly of diseases, and one of the more likely choices for terrorists. It is not only easily spread from one person to another, but there is no effective medical treatment. It may also be unstoppable in an unvac-

cinated population, and since the United States' mandatory vaccination program was stopped in 1972, the U.S. population is very susceptible to smallpox. Even that part of the population that was vaccinated as late as 1972 may have little or no protection against the disease.

Although smallpox was declared eradicated in 1980, two official repositories of the variola virus were kept: one at the *Centers for Disease Control and Prevention* in Atlanta, and the other at the *Russian State Research Center for Virology and Biotechnology* in Koltsovo, Novosibirsk in central Siberia. Those supplies were to be used for scientific research and vaccine development, but it is now known that both countries maintained secret biological weapons programs since 1980. By 1990 the Soviet Union had a facility capable of producing 80 to 100 tons of smallpox a year, and it typically warehoused 20 tons. Although Russia and the United States have since abandoned their biological weapons programs, other countries still have them. It is thought that several rogue states like North Korea and Iraq and possibly terrorists have obtained samples of the smallpox virus.

Although the exercise took only two days, it simulated a time span of two weeks occurring between December 9-22, 2002. The exercise involved three *National Security Council (NSC)* meetings taking place on Dec. 9, 15, and 22, with the participants being made aware of evolving details of the attack and being required to establish strategies and make policy decisions to deal with it.

Exercise controllers acted as special assistants and deputies, providing facts and suggesting policy options to deal with the smallpox outbreak. Simulated newspaper coverage and TV video clips of the ensuing epidemic were also shown to participants, and various simulated memoranda, intelligence updates, and top level assessments of the spread of the epidemic were provided to key players whose jobs would normally require such information.

Each of the three NSC meetings began with controllers giving the NSC players briefings on the progress of the attack, an assessment of who the perpetrators might be, the response of the public, the comments of foreign governments, and any other information they would normally receive in such an emergency.

Assumptions

Several assumptions were made for this exercise, based on historical evidence and a variety of data related to susceptibility to smallpox:

- **Assumption 1: It was assumed that the initial attack was from "weaponized smallpox," similar to what the former Soviet Union would have developed in its secret bioweapons program.**

This would be a far more efficient way of attacking the U.S. than with, say, infected jihad volunteers walking

among the U.S. population. Weaponized smallpox can be aerosolized and dispersed in a variety of ways, such as attaching an aerosol device filled with weaponized smallpox, complete with a timer, to the wall of a shopping mall, airport, or ventilation system of an enclosed stadium, or attaching a spraying device to an unmanned drone (UAV) that has been programmed with global positioning (GPS) maps and flying it over a populated area.

- **Assumption 2: The U.S. population's "herd immunity" to smallpox was 20%, so that 228 million of its citizens were highly susceptible to infection.**

This is a matter of debate. It is known that 42% of the population has never received a smallpox vaccination, and the remainder have declining immunity from vaccinations about 30 years ago. No one knows for sure, but epidemiologic data suggest that initial vaccination gives protection for 5 to 10 years, while revaccination gives even greater protection, possibly more than 10 years. Those who have been vaccinated twice, then, say as a child and while in the military, should have the greatest immunity.

- **Assumption 3: The transmission rate of the disease was 10 to 1, that is, each infected person infected 10 others.**

Although transmission rates have varied widely historically depending on susceptibility of a population, the strain of disease, and various social, demographic, political, and economic factors, the simulation designers considered a 10 to 1 transmission rate a conservative estimate. The U.S. population, they pointed out, is highly susceptible because vaccinations stopped in this country 30 years ago. Also, we are a highly mobile society. By the time the first victims are diagnosed with smallpox (9-17 day incubation period), the disease will have already begun spreading to a second generation of victims. Some of the initial victims and the second generation of victims will have travelled to other cities by that time. Since few American doctors have ever seen a case of smallpox, and since the initial symptoms resemble flu, diagnosis is liable to be slow.

For this simulation, the 10 to 1 estimate was based on 34 smallpox outbreaks in the past involving cases of smallpox being accidentally imported into a country that no longer had endemic smallpox. Twenty four of the outbreaks occurred in winter, which is the time when smallpox spreads most readily and which is the time within which the simulated attack occurs. Of these 24, 6 outbreaks most closely paralleled the conditions of the *Dark Winter* exercise, and they were used to make the 10 to 1 estimate. The number of second generation cases in those 6 outbreaks ranged from 10 to 19.

One reason the 10 to 1 estimate is thought to be on the conservative side is because of the 1972 outbreak in

Yugoslavia, which encompassed many of the aspects one finds today in American society, namely, a great number of susceptible people and a wide geographic dispersion of cases. In that outbreak a man on a religious pilgrimage to Mecca and Medina was infected with smallpox while in Iraq, then brought it back to Yugoslavia. His infection was not diagnosed, nor were the 11 people he infected suspected of having smallpox. Not until 140 new cases developed was the epidemic recognized as smallpox. Some 35 people died from this single initial infection.

- ***Assumption 4: The U.S. Centers for Disease Control and Prevention (CDC) had 12 million doses of vaccine available at the time of the exercise.***

The CDC actually had 15.4 million doses, but practical experience from the 1960s and 70s smallpox eradication programs showed that it was common to lose 20% of a vial's vaccine due to inefficiencies and waste.

- ***Assumption 5: In the initial attack at three shopping malls in Oklahoma City, Philadelphia, and Atlanta, 3,000 people were infected.***

This is considered a plausible scenario scientifically since it would take only 30 grams of weaponized smallpox to infect 3,000 people via an aerosol attack.

The 1st NSC meeting, Dec. 9, 2002

The initial attack:

On December 9, 2002, during the first of three NSC meetings that will take place in this simulation, the 12 NSC members are told that a smallpox outbreak has occurred in the U.S. In Oklahoma, 12 cases of smallpox have been confirmed, with 14 more suspected. There are also suspected cases of smallpox in Georgia and Pennsylvania.

The governor of Oklahoma, Frank Keating, who is in town to make a speech, attends the meeting. NSC members are briefed on the disease, its lethality, its contagion, and the availability of smallpox vaccine.

All this takes place against a backdrop of the following geopolitical situation:

- Iraq is again threatening to invade Kuwait, and leaders of Kuwait, the United Arab Emirates, and Bahrain have requested the U.S., Britain, and France deploy troops to the region. The NSC meeting has been called to consider deploying forces.
- Since sanctions against Iraq had been lifted six months prior, it has been discovered that Saddam Hussein is aggressively pursuing a bioweapons program.

- Several top scientists from the former Soviet secret bioweapons program are believed to have been working in Iraq and Iran for the past year.
- An Al Qaida terrorist was recently caught trying to buy plutonium and biological pathogens from Russia.

President Nunn informs the NSC members that the agenda of the meeting has changed, that the U.S. has been subjected to a suspected smallpox attack, and that it could be related to their anticipated decision to deploy troops to the Mideast. No one has yet taken credit for the attack.

He introduces Governor Keating, who says hospital emergency rooms in Oklahoma City hospitals are very crowded and that many in the hospital staff have failed to show up for work, fearing a smallpox infection they might bring home to their families. The media is broadcasting nonstop news about the smallpox outbreak, and the Governor is already considering calling out the National Guard if fear continues to grow among the populace. He has already declared a state of emergency and requests the President do the same. He goes before the news cameras in a few hours, he says, and he'd like to be able to tell the people of Oklahoma that all 3.5 million of them will get the smallpox vaccine within 72 hours.

The NSC is then briefed on smallpox, using various slides of actual smallpox cases and statistics relating to the progression, spread, and lethality of the disease: U.S. doctors have no experience with smallpox and there is no rapid diagnosis or treatment. Isolation or vaccination are the only defenses. Only 12 million doses of vaccine are available, and a CDC contract for an additional 40 million doses will not be filled until 2004. The worldwide supply of vaccine is 60 million doses, but some of it is believed worthless due to inadequate storage by some countries.

The NSC members are told that the CDC has sent 100,000 doses of smallpox vaccine to Oklahoma, with vaccinations restricted to infected people, their close contacts, and investigators.

Council members are also told that the attack most likely occurred about Dec. 1, due to at least a 7-day incubation period for the disease. The second generation of cases, then, would be about Dec. 20, 11 days away. Urgent action is needed to halt the spread of the disease, but a modern, urban, mobile population, coupled with a limited supply of vaccine, does not offer encouraging prospects for controlling the outbreak.

The FBI tells the Council they will have 200 agents vaccinated and sent to Oklahoma within 24 hours, but they have no leads as yet. Several possible culprits are named: Iraq, Iran, North Korea, China, Russia all have the capability. But anyone who has obtained samples of smallpox, possibly from an unemployed Soviet scientist, could grow smallpox and launch an attack.



Child with full-body distribution of smallpox eruptions, Pakistan, 1955

Council members consider their options. The CDC and local authorities would already be isolating victims and their closest contacts. Should public gatherings be curtailed and schools closed? How should the available vaccine be distributed? Should the National Guard be activated, and should it be under state or federal control? Should there be mandatory or voluntary vaccinations? What should the public be told? What should be done about the deployment of troops to the Mideast?

They agree to inform the public quickly and completely to ensure cooperation with disease control measures. They decide to use the “ring method” of vaccination, which worked so successfully in eradicating the disease in the 1960s and 70s. With the ring method, all first contacts with the victim are vaccinated, then a second ring of secondary contacts are vaccinated. The NSC decides the ring method should also be used in other states, should the virus break out there. For strategic purposes they reserve 1 million

doses of vaccine for Department of Defense (DOD) needs, and instruct the DOD to determine its priorities. They also decide to deploy an additional aircraft carrier battle group to the Persian Gulf to join the one already there.

The final action of the NSC is to prepare a presidential statement for the news media, which the President delivers to a nationwide audience from the press room.

The 2nd NSC meeting, Dec. 15, 2002 The outbreak spreads:

The second NSC meeting opens with a review of the following *news video clips*:

- 300 people are dead and 2000 are infected in 15 states. Hospitals are overwhelmed as tens of thousand of sick or fearful people seek medical help. Many hospital employees are not showing up for work.
- The epidemic has spread to Canada, Mexico, and the United Kingdom, with Canada and Mexico asking the U.S. for vaccine.
- Violence has broken out in some areas, with riots around a vaccination site in Philadelphia leaving two dead. Police and the National Guard are trying to control the crowds.
- Many countries have closed their borders to people travelling from the U.S. unless they can show proof of recent smallpox vaccination.
- Governor Keating is considering closing all stores to try and halt the spread of the disease. Malls across the country are already virtually deserted. The Governor has closed all schools and universities and cancelled all sporting events.
- The federal government is being widely criticized from all quarters for failure to have an adequate smallpox vaccine on hand. The lone pharmaceutical company capable of making smallpox vaccine says that at most it can produce 4 million doses per month, even if all FDA regulations are waived. Russia has offered to provide 4 million doses of vaccine.
- Panic buying is beginning to occur in some cities as food deliveries are slowed by the reluctance of truckers to go into areas with smallpox. There are sporadic reports of people of Arab appearance being assaulted on the street.

A *memo* is given to the Attorney General. It clarifies the *Stafford Act*, the *Posse Comitatus Act*, the *Federal Quarantine Law*, the *Insurrection Act*, and *Martial Law*, all laws designed to invoke federal authority in a national emergency. Among other things, the laws would allow the President to declare a national emergency and use military troops to quell civil disturbances, authorize the forced inoculation and isolation of people who could spread a commu-

nicable disease, restrict travel, dispose of bodies in ways contrary to personal beliefs, suspend habeas corpus (that is, arrest without due process), and curtail other liberties as needed.

Another *memo* to the FBI Director and Attorney General states there is a high probability that the attack came from another state or a state-sponsored terrorist group, and that an initial analysis of the smallpox used indicates it came from Soviet Union stocks or North Korea. The memo notes that as little as two years ago North Korean Special Forces were still receiving smallpox vaccine.

The President is handed a *memo* suggesting it may be problematic going forward with a war in the Persian Gulf, given the severity of the domestic crisis. He addresses the council members, announcing that the Secretary of State is ill and hospitalized. He says the lack of vaccine and the tactics of some states to stop the epidemic has led to serious economic disruption and civil unrest in some areas.

The Chair of the Deputies Committee, Dr. Tara O'Toole, outlines the progress of the epidemic and says all cases appear related to three initial attacks in Oklahoma, Georgia, and Pennsylvania. Vaccine, unfortunately, is running out amid growing political pressure to vaccinate more broadly. One million doses of vaccine are still being held for military personnel facing the potential war in the Persian Gulf. With all the vaccine that has been distributed, 1.25 million doses remain.

Dr. O'Toole further states that there is growing public demand for the forcible relocation of infected people to isolated facilities. She says contacts of infected people are not complying sufficiently with voluntary home isolation. There is also dangerous misinformation in some media about good vaccine and bad vaccine, advice to flee cities, claims that poor neighborhoods are being denied vaccine, and hate speech directed at certain ethnic groups.

The FEMA Director delivers his remarks: Health care facilities have become nonfunctional in some communities due to overcrowding and workers staying away from their jobs. At least 20 hospitals have closed their doors in Oklahoma. In many states National Guard troops are providing security at hospitals, even delivering food and critical supplies. Many states have prohibited public gatherings, stopped transportation, and closed airports.

Once again the NSC considers its options. Members decide to leave the National Guard, as well as quarantine and isolation issues, in the hands of the states. They will accept the vaccine from Russia, and proceed with a crash program to manufacture vaccine even though liability issues have not been resolved. They opt for mandatory isolation of all smallpox victims in dedicated facilities. They will encourage voluntary isolation of contacts using National Guard and Defense Department resources to supply food. Federal travel restrictions will be established, and penalties

will be imposed for the promulgation of dangerous information.

An intelligence memo is given to NSC members: It indicates that a new exclusionary zone has been established by Iraq around a suspected bioresearch facility near Samarra. Activity at the facility appears normal but villages for a 10-mile radius around it appear to have been abandoned.

In a memo delivered to the Attorney General, there are reports of increasing incidents of violence, mainly against people with dark skin or who appear Arab-American. Two mosques have been defaced and one burned in the last 24 hours. In downtown Chicago, three dark skinned youths were shot dead, apparently because they looked Middle Eastern. The ACLU has sued Pennsylvania over the issues of mandatory vaccination and curtailment of transportation.

The NSC watches a newsclip in which the Governor of Texas announces the suspension of all travel between Texas and Oklahoma. He urges other governors to do the same, and he strongly criticizes the federal government for being "unable or unwilling to prevent the spread of the smallpox virus."

President Nunn addresses the nation on national TV. He relates the gravity of the crisis and appeals for Americans to remain calm and work together to defeat the virus, and to heed the advice of their elected leaders and health officials.

The 3rd NSC meeting, Dec. 22, 2002 A crisis out of control:

The third and final NSC meeting opens with a review of *news video clips*:

- The number of smallpox cases has reached 16,000, with 1,000 people now dead. The epidemic has spread to 25 states and 10 other countries. Although investigation suggests all cases are related to the initial attack in three states, the evidence does not rule out additional or ongoing attacks.
- The U.S. is suffering severe economic damage. In Atlanta and Philadelphia, most businesses are closed and massive traffic jams are occurring across the state as people try to flee the disease.
- A New York Times poll indicates that most Americans think that the state and federal governments have lost control of the epidemic. A CNN/Gallup poll says nearly half of Americans think the President should use nuclear weapons against any nation proven responsible for the smallpox attack.
- Violence is spreading across the nation as individuals try to keep others suspected of having smallpox at a distance. In New York, two police officers and three family members were killed when

the police tried to escort two family members with smallpox to an isolation area.

Then Dr. O'Toole once again outlines the progress of the epidemic for the NSC:

- In the past 48 hours there have been 14,000 new cases. Of the 1,000 dead, 200 have been from reactions to vaccination. It is estimated that 5,000 more will die within the next two weeks.
- The vaccine has now been depleted, and the U.S. can produce only 12 million unlicensed doses a month, beginning in four weeks.
- A major impact on the U.S. economy continues and there are shortages of many types of food across the nation. People are fleeing cities after the announcement of new smallpox cases.

The NSC asks for a worst case scenario. It is stark:

- By the end of the second generation of smallpox cases (about Jan. 3), 30,000 will be infected and 10,000 dead.
- By the end of Generation 3 (Jan. 20), 300,000 will be infected and 100,000 dead.
- By the end of Generation 4 (Feb. 6, which is 7 weeks after the start of the epidemic), 3 million will be infected and 1 million dead.

A **memo** is given to the Secretary of State:

- Russia, France, and Nigeria are demanding the U.S. share any vaccine it has to help fight the overseas spread of the epidemic.
- Cuba has offered to sell smallpox vaccine to the U.S. Cuba claims it has the know-how to produce the vaccine quickly.

Another **memo** is handed to the Director of the FBI and the Director of Central Intelligence (DCI):

- A credible Iraqi defector claims Iraq is behind the smallpox attack. Iraq has previously denied involvement, but has also warned the U.S. that it will retaliate against any U.S. attack in "highly damaging ways."

Finally, a **printed message** is handed to all members of the NSC. It states that the *New York Times*, *Washington Post*, and *USA Today* have received anonymous letters demanding the U.S. withdraw its forces from the Persian Gulf and Saudi Arabia. The letter claims responsibility for the smallpox attack and contains a generic fingerprint of the smallpox strain matching the fingerprint of the strain causing the current epidemic. Unless the U.S. forces withdraw

in one week, it warns of renewed attacks using smallpox, anthrax, and plague.

The *Dark Winter* exercise ends with the NSC discussing how to respond. If the American people demand they use nuclear weapons, against who? Should they withdraw U.S. troops from the Persian Gulf? And finally, with no vaccine remaining and the epidemic out of control, how do they control the current spread of smallpox and any new attacks with disease?

End of *Dark Winter* exercise

Astonishing! The United States had been brought to its knees by a virus delivered covertly by terrorists who lurk in the dark recesses of the world. Few thought it remotely possible before the exercise, but afterwards many inside and outside of Government became alarmed at the possibility.

The *Dark Winter* exercise was no trivial undertaking. It was carefully planned and orchestrated, primarily by the prestigious John Hopkins University in Baltimore, Maryland, to answer one question: Could America withstand an attack of human-inflicted disease. The answer was a resounding No! — at least in the case of smallpox. We flunked the exercise on a catastrophic scale.

Three months after the exercise the U.S. was subjected to the September 11 attacks against the World Trade Centers in New York City and the subsequent anthrax mail attacks in Washington, D.C. Suddenly the attacks of terrorists were not just the stuff of "what if" simulations like *Dark Winter*. Our Government began working on defense strategies against such attacks, and it started evaluating its stocks of smallpox vaccine.

The vaccine situation is different today than it was in June of 2001 when the *Dark Winter* exercise took place. The U.S. has found more vaccine than we thought we had, and we have diluted other vaccine to make it stretch far enough to cover the American population. There are still questions about the effectiveness of this diluted vaccine after so many years in storage, but new vaccine to cover the entire population is being manufactured and will be ready in early 2004.

Risks associated with the vaccine are another serious consideration not discussed in the *Dark Winter* simulation. I've covered that in another article on page 28 of this issue. Δ

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How safe is smallpox vaccine?

By Dave Duffy

At the start of 2003 the United States began the vaccination against smallpox of half a million health care workers so America can respond to a possible terrorist smallpox attack. It is only the beginning of a plan to vaccinate millions of Americans, beginning with health care workers and the military. The fear is that terrorists, and possibly Iraq, have acquired the deadly and disfiguring smallpox virus and intend to use it against us.

Many people may think no sane human being would consider using a disease like smallpox as a weapon. After all, even the diabolical Nazis of World War II possessed nerve agents and biological weapons but refrained from using them, even as they were bombed into obliteration during the last months of the war. But think again. According to many muslim terrorists, it is God's will that America the Infidel be destroyed.

It is not an unheard of rationale. In at least one documented case during the conquest of the Americas, a British colonel deliberately distributed smallpox infected blankets to Indians, which led to an epidemic among them. And during the Spanish conquest of the Aztecs, which coincided with another smallpox epidemic among the Indians, a Spanish priest wrote in his diary: "Thank you heavenly Father for sending this plague to destroy our enemies." There is even some evidence that the British tried to spread smallpox among the Colonists, and during America's own Civil War, there is an undocumented report of a Confederate supplying unsuspecting Union soldiers with smallpox infected blankets.

Man, historically, has always justified his most reprehensible actions, and muslim crusaders will have no problem justifying a smallpox attack against us.

What is smallpox?

Smallpox is a highly contagious disease caused by the variola virus, which is an orthopox virus in the same family as monkeypox, mousepox, camelpox, rabbitpox, and cowpox. Cowpox is used to make smallpox vaccine, called vaccinia.

Smallpox no longer exists as a naturally occurring disease, having been wiped out by the World Health Organization's (WHO) worldwide smallpox eradication program in the 1960s and 70s. But for thousands of years, since it first appeared about 12,000 years ago in settlements in northeast Africa, smallpox had been one of the most feared of



Man with smallpox. Smallpox has been eliminated thanks to vaccines.

plagues, killing hundreds of millions of people, decimating whole civilizations, and not even sparing kings. The mummy of the great Egyptian pharaoh Ramses V, who died in 1156 BC, bears the distinctive smallpox scarring on his face, and the Roman Emperor Marcus Aurelius was killed by smallpox in a plague that killed millions in the Roman Empire about 180 AD. In the last decades of the 18th century smallpox killed 400,000 Europeans a year, including four reigning monarchs, and in the 20th century the disease killed an estimated 300-500 million people. By comparison, wars in the 20th century, which was history's bloodiest century for warfare, killed 111 million people.

Historically smallpox has killed 30% of its victims, although that number has been higher in very susceptible populations. The New World populations of Indians had never experienced smallpox so were very susceptible. Between 1580 and 1620 smallpox reduced the Aztec population of Mexico from about 20 million to less than 2 million, after Spanish conquistadors had inadvertently introduced it there, and smallpox is the main suspect in reducing the overall North American Indian population from about 100 million at the time of Columbus's arrival to about 10 million a mere 50 years later.

How is it spread?

Smallpox is normally spread through direct contact with an infected person, and transmission of the virus occurs when a person inhales a virus-containing airborne droplet of an infected person's saliva. But it can also spread from contact with an infected person's fluids, clothing, and bedding. It is not spread by animals or insects.

The virus is very stable and will survive for months in an infected person's clothing and bedding, even dried in the dust in his sick room, in the form of viral material from the smallpox pustules or from the pustules' crusted scabs. These are much less infectious than the airborne droplets, but infected clothing and bed linens have historically been a source of smallpox outbreaks in Europe.

Smallpox victims are infectious with the onset of rash, which occurs 2-4 days after the onset of fever, which occurs 10-14 days after initial exposure to the disease. Victims are most infectious during the initial week (after development of rash) when they develop lesions in the mucous membranes of the mouth, tongue, larynx, pharynx, and upper part of the esophagus. The victim sheds part of the lesions in airborne water droplets during this period. As the lesions develop on the skin, the person remains infectious to a declining degree until the lesions turn to scabs and the scabs fall off.

Types of smallpox

There are three types of smallpox, **ordinary**, **flat**, and **hemorrhagic**, that can occur in unvaccinated persons, plus a fourth type, **modified**, that can occur in previously vaccinated people.

1) Ordinary smallpox (Variola major): This is by far the most common type. Once exposed to **ordinary** smallpox, it takes from 7-17 days for symptoms to appear. (The average incubation time is 12-14 days.) Then symptoms are flu-like, progressing from a high fever, cough, and fatigue to headache, backache, and other body aches with occasional vomiting and disorientation. After two to four days of these symptoms, the fever peaks and begins to decline, ushering in a rash that develops into hard painful lesions. The lesions appear first on the mucous membranes and pharynx, then on the face, forearms, and hands. Within a day or two, the trunk and lower limbs, including the palms of the hands and soles of the feet, also become involved with the rash. The rash lasts for about two weeks and becomes most pronounced on the face, forearms, and lower legs. At the end of 14 days the lesions, which by now have developed into hard raised painful sores called pustules, begin to dry up and crust over. By about day 19 the scabs begin falling off, with the scabs on the palms and soles falling off last. The resulting scars, which are most pronounced on the face, are the result of the destruction of the underlying sebaceous glands.

Thirty percent of victims will die, usually from toxemia leading to respiratory or heart failure. Death, if it occurs, is usually in the second week. Some victims will also become blind, generally as a result of opportunistic bacterial infections.

Ordinary smallpox can sometimes be confused with chickenpox. With chickenpox, however, the rash is more uniformly distributed on the body, with no rash on the palms or soles.



Smallpox lesions at day 17 of rash on a 5-year-old convalescing

2) Flat type smallpox: This is very rare and is believed associated with a deficient immune system. It occurs more frequently in children and is characterized by intense toxemia. The lesions remain soft and velvety, and never progress to the pustular stage. Although the majority of cases are fatal, survivors typically are not scarred.

3) Hemorrhagic smallpox: This is also rare and associated with people with a compromised immune system. It occurs more frequently in adults. The virus multiplies in the spleen and bone marrow and leads to the inability of the blood to clot, resulting in spontaneous bleeding from spots on the skin and from the mucous membranes. The illness includes a shortened incubation period followed by severe high fever, headache, and stomach pain. These victims are highly infectious, and death occurs in the fifth or sixth day after incubation, before lesions typical of **ordinary smallpox** have a chance to develop.

4) Modified type smallpox: This type usually appears in previously vaccinated people. The incubation period, followed by headache and body pains, are similar to **ordinary smallpox**. The rash, however, develops without the presence of fever, and lesions are fewer, more superficial, and progress more quickly, with crusting accomplished within 10 days. These victims are infectious, but not nearly as infectious as victims with **ordinary smallpox**.

History of smallpox vaccine

The decision by President Bush to resume smallpox vaccination marks the first time in U.S. history that a nationwide public health preventive measure has been put into operation to defend against attack with disease.

The vaccine for smallpox is called vaccinia. It is a live virus derived from cowpox, a relative of smallpox but much milder.

The earliest form of smallpox inoculation was developed in China and India about 1000 B.C. Called variolation, it consisted of taking the pus from the pox of an infected person and inoculating a healthy person with it. A mild form of

the virus developed and granted the person lifelong immunity. The practice spread to Europe and the New World in the 1700s.

In Britain in the mid 1700s, cowpox was a disease that primarily affected milkmaids, and it was noticed that they became resistant to smallpox after they recovered. In 1774, a British farmer from Dorset inoculated his family with material taken from the udders of a cow with cowpox, thereby granting his family immunity from smallpox. And in 1796 a British surgeon extracted fluid from the pustule of a cowpox victim and injected it into a healthy child, conferring smallpox protection on him. By 1800 smallpox vaccination campaigns using cowpox began throughout Europe.

Modern science has now learned that cowpox is a virus that primarily infects rodents and only occasionally infects cows. It exists primarily in Europe.

The World Health Organization's (WHO) worldwide smallpox vaccination program, designed to eradicate the disease, began in 1967 and ended in 1980 when smallpox was officially declared eradicated, making it the only human disease ever eradicated. The last reported case of smallpox was in Somalia in 1971, and in the United States the last reported case was in 1949. Vaccinations for U.S. civilians stopped in 1972, and U.S. military smallpox vaccinations stopped in 1990. Vaccine production discontinued in the U.S. in 1982.

When eradicated, the world community agreed to keep two samples of the disease in laboratory repositories in the United States at the CDC in Atlanta, and in the Soviet Union at the Russian State Research Center of Virology and Biotechnology in Koltsovo, Novosibirsk, which is in central Siberia.

Vaccination has begun again under a renewed threat of the return of the disease. It is feared that hostile states such as Iraq and North Korea, and possibly terrorists like Al Qaida, now have the smallpox virus and may use it against us. The

The ring method of stopping a smallpox outbreak

At present the Centers for Disease Control's (CDC) plan to contain a smallpox attack includes widespread *voluntary* vaccination but, if necessary, *forced* quarantine of infected individuals and *mandatory* tracing and vaccination of anyone who may have come in contact with them.

They will employ the "ring" method to control an epidemic, namely vaccinate everyone who has had contact with an infected person, then vaccinate the ring of people who have had contact with the first set of contacts. It's the method used so successfully in the 1960s and '70s to finally eradicate smallpox.

Keep in mind that for up to four days after exposure to smallpox, vaccination will either keep a person from catching the disease or lessen its severity.

threat has become more credible since the terrorist attacks in New York on Sept. 11, 2001 and the subsequent anthrax attack by an unknown person or persons shortly thereafter.

Types of vaccines and availability

There is currently enough smallpox vaccine to vaccinate all 288.6 million residents of the U.S. This includes about 75 million doses of the 1970s era Dryvax vaccine and about 300 million doses of the 1950s era Wetvax vaccine. The old vaccine has been stored cold and has been tested every two or three years to test its potency. Some of the vaccine has been diluted up to five times to make it go further, but tests indicate it is still potent.

The U.S. has ordered 209 million more doses of a more modern smallpox vaccine from Acambis Inc., a Cambridge, Massachusetts based company, and it should be ready for use in early 2004. It hasn't been fully tested but initial tests indicate it will be safe and effective. The FDA has not yet licensed enough of any of the vaccine for general public use, but it will be made available to the public without licensing in the event of a smallpox epidemic emergency. There is no definitive way to test the potency and safety of the new vaccine in the absence of an outbreak of smallpox.

Protection

Successful vaccination produces total immunity to smallpox. Once vaccinated, it takes approximately 7-10 days to achieve protection. However, if you are vaccinated within 3-4 days of initial exposure to smallpox, you may receive total protection from the disease, or at least protection against severe illness. The vaccine is then good for about 5-10 years (no one knows for sure). If you are later revaccinated it is believed immunity from smallpox lasts even longer, although how long no one knows. There is no danger in being vaccinated multiple times. Dr. D.A. Henderson, the director for the Center for Civilian Bio-Defense Studies at Johns Hopkins University, who in 1966 was the WHO director overseeing the global eradication of smallpox, says he has been vaccinated between 25 and 100 times. The live vaccinia virus vaccine, he says, must grow in your skin to produce immunity to smallpox. If you are already sufficiently immune, the vaccine simply does not grow in the skin.

The severity of lesions from smallpox can vary greatly, either naturally or because vaccination years before has given a person partial, but not complete, protection. With nearly complete protection from vaccine, few lesions will appear, but even



Close-up of the skin reaction at a smallpox vaccination site

Vaccinia Immune Globulin

A major difficulty in treating adverse reactions to the vaccine is that in past years bad reactions were treated with vaccinia immune globulin (VIG), which is serum derived from people who recovered from infection with the vaccine virus. Due to the absence of smallpox vaccinations for 30 plus years, the supply of VIG is now about 700 doses, which is enough for anticipated adverse reactions if only 6 million people get vaccinated. Additional doses of VIG are being produced.

if a person was vaccinated many years before, lesions may be far less and more superficial than for a person who was never vaccinated. In this case a person could get a mild case of smallpox, with an accompanying mild rash. He will not die and may not even get very sick, but he may be contagious, capable of passing along fullblown smallpox to another person.

Adverse reactions to vaccine

Smallpox vaccine has a higher adverse reaction rate than any of the modern vaccines generally given. Based on the statistics of the 1960s and 70s smallpox eradication program, as many as 50% of people being vaccinated will have some sort of reaction from the vaccine, ranging from a sore, swollen arm and swollen glands to flu-like symptoms. In a study of adult primary vaccinees, it was determined that 36% became sufficiently ill to miss school, work, or a recreational activity, or to have trouble sleeping. In another study 17% had fever of at least 100 degrees Fahrenheit within two weeks of vaccination, 7% had a fever of 100 degrees or more, and 1.4% had a fever of 102 degrees or more.

One or two of every million people who get the vaccine for the first time will die from it, 15 to 50 will have life threatening reactions including eczema vaccinatum, progressive vaccinia (vaccinia necrosum), and post vaccinal encephalitis, and approximately 1,000 will have serious reactions including a toxic or allergic reaction at the vaccine site and spread of the vaccinia virus to other parts of the body. If all 130 million Americans never vaccinated got vaccinated, about 250 would die and 2,000 would have life-threatening reactions. This does not include people with AIDS, who could be very severely affected.

The data showed that the death rate and adverse reaction rate for those being revaccinated was cut by two-thirds, but still if all 158 million Americans who were previously vaccinated were to get revaccinated, it is expected that 40 would die and 800 would have life threatening reactions. Again, this does not take into account people with AIDS or other immune system problems.

Compare these adverse reaction rates with a more modern vaccine such as the measles/mumps/rubella vaccine, which

has experienced 11 adverse reactions and no deaths among the 30 million people vaccinated in the last 12 years. The newer smallpox vaccine, the 209 million doses still under final testing, is expected to have fewer adverse reactions than the older smallpox vaccine.



Secondary infection of the cornea in a 12-year-old male

The death rate and adverse reaction rate may be much higher today because the U.S. population, or any modern population, is highly susceptible to smallpox because it has been so long (1949) since the disease has been present in the U.S. and because it has been so long (1972) since vaccinations were discontinued. Health officials expect the death and adverse reaction rate to be much lower among that older 58% of our population that has been vaccinated in the past, even though for most of them it has been the distant past, and they expect the adverse reactions in the younger 42% of the population never vaccinated at all to be significantly higher.

The most frequent complications of smallpox vaccination

From previous data, adverse reactions from vaccination occurred most often in people receiving their first dose of the vaccine, and among children under the age of 5. Following are the most frequent complications.

Inadvertent inoculation at other sites. This accounted for half of all complications of vaccination. Occurring in 1 of every 2,000 primary inoculations, it generally resulted from the hand touching the vaccination site, then touching another part of the body, thereby transferring the vaccination. The most frequent inadvertent inoculations occurred on the mouth, eyelid, rectum, genitals, nose, and face. It generally resolves itself.

Generalized vaccinia. This occurred in 1 of every 5,000 primary vaccinations, and it is the result of blood-borne dissemination of vaccinia virus. It generally resolves itself unless there is an underlying condition involving an immune deficiency. Vaccinia Immune Globulin (VIG) (See Sidebar) can be used to successfully treat cases involving the eye.

Eczema vaccinatum. This occurred in 1 out of every 26,000 primary vaccinations, and it occurred in people who had current or healed eczema or other chronic skin problems. It typically covers the area affected by the skin condition, and it is usually mild and resolves itself. But on occasion it can be severe or fatal. VIG is used to successfully treat serious cases.

Progressive vaccinia (vaccinia necrosum). This is rare, severe, and often fatal, and it is caused by the vaccine site's

People who should not get vaccinated

Eczema, dermatitis. People who have had or now have atopic dermatitis or eczema should not get the vaccine unless they are exposed to smallpox. As many as 40 million Americans, or up to 15% of the population, have had or currently have eczema, which puts them at higher risk for a potentially fatal skin infection called eczema vaccinatum. The risk is particularly great for children, who have experienced a threefold increase in eczema since smallpox vaccination ended three decades ago. In a study from the 1970s, 123 people out of one million vaccinated people got eczema vaccinatum, most of them children. In another study in Europe, 6 percent of people infected with eczema vaccinatum died from it. Running the numbers, if the 40 million Americans suspected of having had or currently having eczema were to get the vaccine, the death toll among them would be 295.

AIDS, other immune deficiency disorders. People who have a suppressed immune system, such as people who have had transplants or who have cancer, leukemia, lymphoma, or people with HIV and AIDS, are high risk groups. AIDS was not a known disease when vaccinations were given 30 years ago, so the severity of reaction for people with AIDS is not clear. Side effects can include brain swelling and extensive toxicity. Of particular concern to health authorities are the 100,000 to 350,000 Americans who have AIDS but who don't know it. Also, if you are taking immune suppressive medications such as corticosteroids, or if you are undergoing radiation, you should not be vaccinated.

Pregnant women, children. Pregnant women should not be vaccinated, nor should they be vacci-

nated if they plan to get pregnant within one month of vaccination. Infants should also not get the vaccine.

The current recommendation that infants not be vaccinated is in sharp contrast to the smallpox vaccination programs of the 1960s and 70s, when most of the vaccinations were given to children under the age of 1. Now, children under the age of one year are considered at increased risk for vaccine-caused brain infection. Children have been omitted from all of the current studies involving smallpox vaccines. Because children are more prone to touching the vaccination site, then touching other parts of their bodies such as their eyes, or even touching other children, the vaccination site should be covered with a special extra sticky bandage.

Also, if you have any of the following conditions you should not get the vaccine until you have completely healed: burns, shingles, impetigo, herpes, severe acne or psoriasis, and chickenpox.

Since the vaccinia vaccine is a live virus and can accidentally spread to others causing inadvertent vaccination, those people living with any of the above at-risk people should not be vaccinated. A vaccinated person is infectious until the vaccination site scabs over. A vaccinated person could spread the vaccinia virus by touching the vaccination site, then touching another person. In the 60s and 70s it was common for this to happen among young siblings.

In all, about 50 million Americans should not get the vaccine, either because they have one of the conditions mentioned above or because they live with someone who does.

failure to heal. It occurs in people with underlying immune disorders and can occur after primary vaccination or revaccination. VIG is used to treat it, but with varying success.

Post-vaccination encephalitis. Also rare, this occurred in 1 out of 300,000 cases of primary vaccinations, with most occurring in children under the age of one year. It is characterized by fever, headache, vomiting, and sometimes convulsions, paralysis, or coma. Symptoms manifest themselves 8-15 days after vaccination. About 15-25% of cases died and another 25% had permanent neurological damage. VIG is not effective.

Sufficient voluntary vaccination means high U.S. "herd immunity"

A survey of Americans in late 2002 indicated that more than half of Americans would be willing to get vaccinated. But the survey was taken before there was widespread understanding of the risks involved.

At present the vaccine is being made available only to the military and the 10 million or so emergency health care "first responders" such as police, firefighters, ambulance crews, EMTs, hospital emergency care workers, etc. When the vaccine is made available to the public, it will be on a voluntary basis. People will simply have to weigh the risk of having an adverse reaction against the risk that we will be attacked with smallpox. The idea of making it widely available on a volunteer basis is to build up "herd immunity." Since a certain number of people will opt for the vaccine, the nation's "herd immunity" will increase. Then if we are attacked with smallpox, the increased herd immunity will lessen the severity of any resulting epidemic.

In the event of a smallpox epidemic, the Centers for Disease Control and Prevention (CDC) recommends everyone get vaccinated, even if you have AIDS. The risk of getting smallpox far outweighs the risk of having an adverse reaction from the vaccine. The vaccine can be taken for up

How vaccine is given

The vaccine is given by dipping a bifurcated (two-pronged) needle into the vaccine, then puncturing the skin of the upper arm 15 times in a few seconds. The puncturing of the skin is not deep. If the vaccination is successful, within three to four days a red, itchy bump will form, then develop into a large blister that fills with pus and drains. In two weeks the blister dries up and a scab forms. The scab falls off in the third week and leaves a small scar. To prevent the vaccinia virus in the vaccine from spreading to other people or other parts of your body, the vaccine site should be covered with a bandage. Children especially should be watched so they do not touch the site, then inadvertently touch, say, their eye.

to four days after exposure to smallpox and still be effective in either preventing the disease or greatly lessening its effects.

Although the CDC says smallpox vaccination will be on a voluntary basis, it is anticipated that in the event of an attack and subsequent smallpox epidemic, smallpox vaccinations will likely become mandatory in affected areas. Quarantines and isolation will definitely be mandatory. Based on historical experience, there is no other way to contain an epidemic.

You won't be able to sue

If you are one of the unlucky ones who does get an adverse reaction to the vaccine, you won't be able to sue anyone. The *Homeland Security Act* has a provision protecting vaccine makers and healthcare providers from such suits. People injured may sue in federal court, but they will have to prove negligence, which will be just about impossible because the vaccine is advertised as coming with risks. The liability protection for vaccine makers was deemed necessary in light of the fact the U.S. needed a new vaccine fast and no company was willing to make one unless they got liability protection.

Genetically-altered smallpox

All of the above may become moot if we are attacked with a genetically-altered form of the smallpox virus. No one knows if such a virus exists, but Soviet defector Dr. Ken Alibek, the former chief scientist and first deputy director of Biopreparat, the former Soviet Union's secret offensive bioweapons program, says the Soviet Union was working on such a virus when he left their program in 1992. Dr. Alibek is now a U.S. citizen and chief scientist at a private company in the U.S. that specializes in researching and developing medical defenses against biological weapons.

Also, both *NBC News* and the *New York Times* have reported that another former Russian virologist, the late Dr.

Nelja Maltseva, may have given the genetically-altered strain of smallpox to Iraq.

Researchers have tested their ability to alter a related orthopox virus. They inserted the gene interleukin-4 into the mousepox virus, then exposed mice previously vaccinated against mousepox to the genetically altered virus. As they feared, many of the mice died. They are not sure if a genetically altered smallpox virus would defeat the smallpox vaccine, but it is definitely a fear.

The Iraq connection

Before they were thrown out in 1998, U.N. inspectors had discovered that Iraq had experimented with camelpox, another relative of smallpox, and one fear is that camelpox, which ordinarily does not harm humans, might be modified and used as a biological weapon. The smallpox vaccine, however, protects against all orthopox viruses, including camelpox. During their inspections in Iraq, U.N. inspectors found a freeze-drier labeled smallpox. Also, after the first Gulf War, 69 Iraqi prisoners of war were blood tested and were found to have built up immunity to smallpox, indicating prior vaccination against the disease. The obvious question is why?

Genetically engineered vaccines and anti-viral agents

U.S. scientists meanwhile are working on a genetically engineered vaccine that will be more effective with fewer side effects than old vaccines. They are also working on anti-viral agents that could, for the first time in history, effectively treat a person already infected with smallpox. No one knows if these efforts will be successful any time soon, but early laboratory studies suggest the drug cidofovir may be effective. Tests with animals are ongoing and being monitored by the CDC and NIH. There are 3500 doses of cidofovir on hand at present, which is enough to handle anticipated reactions if 15 million people are vaccinated. It will be administered under an investigational new drug protocol. Otherwise, there is no treatment beyond intravenous fluids and medicines to control pain and secondary infections.

Resources

For up to date information on the vaccine situation, you can call the CDC hotline: English: 888-246-2675; Spanish: 888-246-2857 or send them an email: cdcre-sponse@ashastd.org. On the internet you can find lots of information on smallpox and the smallpox vaccine, as well as on other biological and chemical threats, at the following sites: CDC.gov, WedMD.org, Cato.org, pbs.org, hopkins-biodefense.org, mipt.org, fas.org. Δ

Think of it this way...

By John Silveira

Biological and chemical weapons through history

The weather here on the coast of Oregon is nice almost all year-round, and there almost always seems to be some kind of fishing—salmon or winter steelhead running on the Rogue, or rock cod, ling cod, halibut, cabezon, and more out in the ocean. So I wasn't surprised when I arrived at the magazine one morning, and parked at the curb in front of the office was the truck belonging to O.E. MacDougal, our poker playing friend from southern California.

I paused to look in the passenger's side window of his truck. There was a tackle box on the seat along with a bottle of Tabasco Sauce that looked as though it had been opened, and a few unopened cans of sardines.

"Mac here?" I asked Muriel as I went in the front door.

"No, but his truck is. I think he went that way on foot," she replied pointing north toward town.

A while later Dave Duffy came in. Dave's the guy who publishes this magazine.

"That's Mac's truck out front, isn't it?" he asked.

"Yeah," I said.

"Is he here?"

"I don't know where he is," I said. "Muriel thought she saw him walking downtown."

"Want to go for coffee?" Dave asked. "Maybe we'll catch him. There aren't that many places he goes to breakfast when he's up here."

Just then Mac walked into the office.

"Hey, Mac," Dave said. "We were just going to head out and see if we could find you."

Mac looked around, then sat in the stuffed chair near my desk. We made some desultory small talk about Mac's trip, about the weather, and the fishing prospects, while Dave and I got ready for our workday.

Dave's wife Ilene, the business manager for the magazine, came in and stood there a second staring at Mac.

"You're here!" she exclaimed. "When did you show up?"

"About an hour and a half ago. I went downtown, ate, then took a walk."

"Well, you'll have to come up for supper tonight," she said. "We're having salmon patties."

With that, she went to her office.

Dave started going through his mail and I was looking through the in-basket of submissions. Mac looked as though he was about to nod off.

"Hey, Mac, what do you think of all this terrorist stuff?" Dave suddenly asked.

Mac acted startled for just a second. He must have driven through most of the night. "Well, it's certainly something to be concerned about," he replied.

He sat there gathering his thoughts for a moment. "The 9/11 thing they pulled off was spectacular," he said. "But it's hard to tell whether they'll be able to pull off anything that dramatic again."

"What about the possibility of biological warfare or a chemical attack?"



John Silveira

Dave asked as he still sorted through the envelopes on his desk.

Mac looked in Dave's direction. "Well, you know what people keep saying, 'We didn't expect them to use airliners as flying bombs, so we can't predict what they may come up with next.' There's a whole lot of truth in that statement."

"So, do you think they'll do something again? Something that involves biologicals or chemical weapons?" Dave asked.

Mac shrugged. "I think they will *if* they can figure out how to do it, and *then* if the opportunity presents itself. I think flying planes into buildings was easier to plan and execute than committing an attack with biological or chemical weapons is going to be. But I don't think they're likely to be

able to repeat their success with airliners again."

"What makes the chemical and biological weapons difficult?" I asked.

"Consider the difficulties the Aum Shinrikyo sect, in Japan, had with their sarin gas attack on a Tokyo subway. It wasn't their first try. They'd bungled some previous attempts. Some that included botulism and anthrax attacks. But even when they released sarin gas, a deadly nerve gas, in the confines of a subway, though they injured almost 6,000 people, they only killed a dozen.

"Their attacks did cause some damage, but the sect had recruited bright young scientists and engineers to poison people in a densely populated country, and they had less than impressive results. Certainly not even close to the scale that Al Quaida would have with airliners on September 11th. I can't see how it's going to be easy for Muslim terrorists to do a whole lot better than Aum Shinrikyo did. But they're certainly going to try. And I'll bet they've learned from Aum Shinrikyo's mistakes."

"What kinds of attacks might they stage using biological and chemical weapons?" I asked.

Mac thought a moment. "Let's start with biologicals," he began. "There are two types. The first involves diseases like anthrax and botulism where victims must come into direct contact with the stuff to be affected. Botulism, for example, can't be passed from person to person, and anthrax only does so rarely.

"The second type, however, and the kind we should fear most involves the use of pathogens like smallpox or the ebola virus. What you're trying to do when you use these biologicals is start a self-sustaining epidemic." He thought another moment. "A pandemic."

"What's the difference between an epidemic and a pandemic?" I asked.

"It's really a matter of magnitude. When you think of an epidemic, think of some kind of disease spreading. When you hear pandemic, think 'epidemic spread out over a *huge* geographical area—even worldwide. It's also used sometimes when describing an epidemic that affects most of a very large population.

"The defeat of the Persian armies, led by King Xerxes, that invaded Greece was due more to the hundreds of thousands of Persian soldiers who succumbed to disease along the way than it was to Greek military might. By some accounts, Xerxes brought an army numbering approximately 800,000, but some 300,000 of them died en route of plague."

"So, if there's an outbreak of ringworm at the local elementary schools, someone may call it an epidemic. You might even call an outbreak of the ebola virus in Africa an epidemic as it spreads from person to person through several villages. In contrast, each year one or another of a strain of flu sweeps the world. That's an epidemic, but because of how widespread it is, it would be more appropriate to call it a pandemic."

"Have we always had epidemics?" I asked.

"They're not new to mankind. They've been with us at least since the first cities in the Old World. We know little about any of those early ones, today, but they were a greater part of human history than is usually taught in school.

"Before the rise of civilization, when humans lived in small isolated groups, there was little chance of epidemics spreading. If a disease leaped from animals to humans in a small village, the whole village may have been wiped out, but it's unlikely that any of them spread far or became pandemics."

"So most of them would have been localized," Dave said.

"That's right.

"But when we started building cities, diseases took on a new face. In cities, with their concentrations of people, there were more social interactions, both within and between groups, and diseases had greater chances to spread. With their large concentrated populations, epidemics became self-sustaining because there were more people to infect. Epidemics could spread because of the sharing of communal water supplies and food, and there was also the infestation of rodents who, along with their parasites, often harbored diseases like plague. Other diseases, such as smallpox, seem to spread only because of social contacts, and cities offered lots of chances for multiple social contacts."

"But how far back in history do we know about epidemics?" Dave asked.

"We know there have been plagues since at least the beginning of recorded history. There are accounts of plagues and epidemics in the Bible. We know from his mummified body that Ramses V, one of the Pharaohs of ancient Egypt, suffered the ravages of smallpox.

"And, though most of the history we learned in school was about battles, kings, and—lately—the social issues that changed the course of history, what we're not told is that many of the great battles that made the world what it is today were determined not by great generals, novel military strategy and tactics, or advanced weapons, but by diseases—epidemics. We are also not told that many of the sweeping social changes that took place in the past, from the end of feudalism to the settling of the New World, were not the result of grand social ideas, but the aftermath of deadly epidemics."

"Any examples?" Dave asked.

"The defeat of the Persian armies, led by King Xerxes, that invaded

Greece was due more to the hundreds of thousands of Persian soldiers who succumbed to disease along the way than it was to Greek military might. By some accounts, Xerxes brought an army numbering approximately 800,000, but some 300,000 of them died en route of plague.

"And what we are often not told is that in 430 BC, when Athens fell to the Spartans who had laid siege to the city, the fall was the result of an epidemic that swept through the city, not Spartan military prowess. Historical records aren't clear as to what the disease was. It may have been smallpox or typhus. Some modern epidemiologists have even raised the possibility that it was the ebola virus or another of the hemorrhagic fevers that cause massive internal bleeding.

"Alexander the Great's conquests were ended with his death at age 32 of pneumonia, most likely brought on because he was suffering from a bout of influenza or malaria. And for the years he marched through Europe, Asia, and Africa, disease was a constant companion of his troops. One of them just finally got him.

"Another good example is the decline of the Roman Empire. Historians have attempted to attribute it to a decline in values and to corruption, but the fact is that epidemics had decimated the Roman Army as well as the civilian population from which it was drawn. This not only led to having to staff the army with foreign mercenaries instead of Roman citizens, but their European enemies, who were largely unaffected by the epidemics sweeping the Empire, were emboldened to carry their wars to the weakened Romans. Some historians speculate that bubonic plague may have been the prime cause of the fall of the Roman Empire, not decadence.

"And the epidemics that spread back then were more brutal than we can imagine. In the sixth-century writings of John of Ephesus we find accounts of the Plague of Justinian

that would boggle the modern mind. There were cases of ships that floated at sea for weeks, their entire crews dead from plague, until they washed ashore. And although we can't be sure of the accuracy of his numbers, he also reported the death toll in Constantinople, modern day Istanbul, was 5,000 to 16,000 a day and that the guards at the city's gates stopped counting the dead when the number of corpses passing out of the city for disposal had reached some 230,000.

Some historians speculate that bubonic plague may have been the prime cause of the fall of the Roman Empire, not decadence.

"Today's scholars and demographers estimate that about one third of Constantinople's population died in the four months the plague reigned.

"Later, the Crusaders who marched out of Europe and into the Holy Land fell in greater numbers to microbes than they ever did to Saracen swords. One Crusade saw 100,000 people leave Europe and only 5,000 return. The overwhelming majority died of diseases either en route to, or when they reached the Holy Land.

"And when the feudal system came to an end in the 14th century, it wasn't because of economic theory, it was because of the shortage of available labor due to deaths brought about by the Black Death, a plague that caught most of Europe by surprise. At least a quarter, and as much as one third, of the population of Europe died in just a few years, and feudal lords, who once all but owned the serfs, suddenly found they had to pay laborers to keep them from fleeing to the cities."

"That many died? As much as a third of Europe? That must have been the epidemic to end all epidemics," I said.

"Not quite. There was at least one greater one. But to have an epidemic

of comparable proportions to the Black Death today in the United States today, we would have to have an epidemic that killed roughly thirty million people each year for two years," he said. "Yet, there may have been an epidemic even greater than the Black Death—in the Americas, among the Indians."

"Yikes," I said. "This isn't the history I learned in school."

"No, it isn't," Mac said. "We also learned that Napoleon's defeat in Russia was due to the Russian winter, and though it can in part be attributed to starvation and cold, the main culprit was the scourge of all armies until the middle of the 20th century—disease.

"There have been thousands and thousands of other epidemics, many that could be classified as pandemics, that have occurred since mankind first moved into cities. And we've never heard of them. Some were local and confined to single cities, and whatever written records there may have been of them were lost.

New World epidemics

"It is because of the lack of written records that the great pestilences that devastated the Indians of the New World went unrecognized for so long."

"This must be the one that exceeded the Black Death," Dave said.

"That's right," continued Mac.

"Early European explorers had encountered numerous Indian villages in North America. So numerous they thought it too crowded to begin new settlements. However, later, when English explorers landed on the coast of North America, there were very few Indians, but the bleached bones of human remains seemed to litter the landscape everywhere they went. The English settled on what they thought was relatively unoccupied land, and historians ignored the reports by the earlier explorers that

the areas had once had large Indian populations.

"It's only been recently that historians have realized what had happened. Diseases, inadvertently introduced by the Spanish conquerors to the Indian populations of Central and South America a hundred years before the English settled North America, had spread north and nearly obliterated the Indians. The Indians had almost no resistance to them and died by the millions.

And when the feudal system came to an end in the 14th century, it wasn't because of economic theory, it was because of the shortage of available labor due to deaths brought about by the Black Death, a plague that caught most of Europe by surprise. At least a quarter, and as much as one third, of the population of Europe died in just a few years...

"The entire New World, North and South America, may have been without epidemics of the sort that ravished the Old World until the first Europeans came and brought with them measles, diphtheria, influenza, mumps, smallpox, malaria, etc., and later cholera. These were diseases unknown to the Indians from Alaska to Tierra del Feugo until 1492, when the white man arrived from Europe and later brought his slaves from Africa.

"And the introduction of these diseases was catastrophic. Modern estimates place the population of the Americas as high as 118 million before 1492. A few centuries later there were fewer than 10 million."

"One epidemic after another attacked the Native Americans. Smallpox, for one, spread so fast across the continent, and ahead of the whites. It was carried by Indians themselves, from one tribe to another so that by the time the white man

reached many areas, the disease had already wiped out most of the native population."

"Indians just disappeared?" I asked.

"When the Spanish explorer, de Soto, traveled along the Mississippi his journals say he encountered some 50 towns and villages along one 200-mile stretch of the Mississippi. But 150 years later, French explorers exploring the same stretch of the river didn't find even one.

"By the 1790s, when the English explorer, George Vancouver, arrived on the coast of what are now the states of Oregon and Washington, there were Indian charnel houses loaded with the corpses of smallpox victims. The disease had apparently made its way across the continent through contacts the tribes had with one another.

"In the meantime, the diseases the Europeans brought infected them as well as the Indians, though because of the way these diseases had swept through Europe, generation after generation, the whites had developed some resistance to them. Death rates among whites were much lower, for all of these diseases, than they were for the Indians who had almost no resistance.

"Still, among the settlements founded by the Europeans, there was epidemic after epidemic. In what was to become the United States, from colonial times on, it was not uncommon to have an epidemic of smallpox followed in a few years by an epidemic of diphtheria, then measles, then smallpox again, then yellow fever, typhus, influenza, diphtheria again, then polio... For example, colonial Boston saw an epidemic of smallpox in 1677, measles in 1687, scarlet fever in 1702, measles again in 1713 and 1729, and so on. Fortunately, the epidemics were usually localized.

"Time and again Boston, New York, Philadelphia, Charleston, and other cities were battered by disease both before and after the Revolution.

"And as the country grew and there was more contact among citizens in the various cites and states—hence, more opportunity to transmit disease—epidemics rose more often, then disappeared. No one knew why.

Modern estimates place the population of the Americas as high as 118 million before 1492. A few centuries later there were fewer than 10 million.

"And every now and then a local epidemic became a pandemic and affected most, if not all, of the country. Sometimes they spread around the world.

"One of the most notable epidemics to originate in the modern United States was one that came to be called the Spanish flu. It actually began at Camp Funston in Kansas and, from 1918 to 1919, it would kill more than half a million Americans and another 25 million people worldwide. By this time, of course, we knew that epidemic diseases were caused by microbes. But that did little to stop it.

Disease in war

"Then there were the epidemics that attended our wars. Disease during war is of interest because, throughout world history, and until recently, disease was almost always responsible for more deaths among the combatants than was actual battle. For every single battle-caused death among Northern troops during the Civil War, two other Yankee soldiers died of typhus, typhoid, smallpox, yellow fever, and other diseases.

"In our war with Mexico there were seven deaths from disease for every battlefield death. And in the Spanish-American War there were almost six disease-related deaths for each battlefield death.

"Even as late as World War I, disease killed seven men for every five who died in battle.

"The reasons for death by disease among the combatants, who were otherwise young and healthy, was the appalling lack of sanitation and pest control and the close quarters in the camps occupied by the troops."

"Worse yet were the living conditions of prisoner of war camps. During its 14 months of existence, Andersonville Prison, in which Confederate forces held Union POWs, saw 45,000 Union troops imprisoned there, and 13,000 of them died of diseases related to malnutrition, overcrowding, or exposure.

"It wasn't until World War II, with the recognition of the importance of sanitary measures, pest control, and mass inoculations against typhoid, smallpox, and other diseases, that America was involved in its first war in which the number of Americans who died in battle exceeded the number who died from disease. It's been that way ever since.

When the Spanish explorer, de Soto, traveled along the Mississippi his journals say he encountered some 50 towns and villages along one 200-mile stretch of the Mississippi. But 150 years later, French explorers exploring the same stretch of the river didn't find even one.

"World War II may well be the first major war in all of history in which a country's battle deaths, among its troops, outnumbered deaths suffered from diseases.

Disease as a weapon

"Had anyone ever tried to use disease as a weapon during their wars?" I asked.

"Yes. But the problem was that, until recently..." He paused.

And Dave said, "...no one knew what disease was or the role bacteria and viruses play in them."

"That's right," Mac said. "Until just a few centuries ago, no one had even seen a bacteria, and until the invention of the electron microscope almost all but a few of the biggest viruses were invisible to even the best optical microscopes. Even after bacteria were known to exist, it was at least another 200 years before anyone made the connection between microbes and disease.

"However, that didn't stop combatants, with a flair of novelty, from trying to employ disease as a weapon. Even centuries ago, they knew that some diseases, such as smallpox, could be spread by contact with the ooze that emanated from the pustules that formed on the bodies of its victims, and they knew that sewage and filth, as well as rotting cadavers, were related to or apparently caused at least a few diseases such as typhoid. And so biological warfare was born."

"Without having to know microbes existed," I said.

"That's right.

"The polluting of wells and water supplies with corpses of both men and animals is as old as history. Romans were known to throw dead animals into the water supplies of their enemies with the intent of weakening and demoralizing them. Often, it worked.

"Centuries later, right here in the United States, Confederate troops similarly led animals to ponds where they shot them and left their bodies to rot in the water so as to deny Sherman's advancing army any potable water supplies as it made its way to the sea.

"Sherman was less than amused by it and thought the southerners were barbaric as his troops burned farms, villages, and towns, one after another, and plundered the countryside wholesale to keep his army fed and moving.

"In 1340, during the siege of the castle of Thun L'Eveque in Hainault, in what is now northern France, attackers catapulted bodies of dead

animals, including horses, over the walls with the idea of spreading disease. And though, as I've said, there was no germ theory of disease back then, they just knew that those who died of disease could often still spread it. They also knew that rotting bodies themselves could cause various other diseases. After a while, and after enough bodies had been lobbed into the castle, the attackers forced a truce.

One of the most notable epidemics to originate in the modern United States was one that came to be called the Spanish flu. It actually began at Camp Funston in Kansas and, from 1918 to 1919, it would kill more than half a million Americans and another 25 million people worldwide.

"In 1346, while conducting a siege of Caffa—now Feodosia, Ukraine—a port on the Crimean peninsula in the Black Sea, an outbreak of plague, the Black Death, swept through the ranks of the Tartars who besieged the city. The siege failed, but before they called it off, they catapulted the bodies of their comrades who had died of the disease over the city walls and into the city itself. Terrified residents fled Caffa, but some of those fleeing were *already* infected and they carried the disease with them to Italy, starting the second major epidemic of the Black Death to sweep through Europe.

"In 1422, forces attacking Karlstein, in Bohemia, catapulted animal manure—roughly 2,000 cartloads of it, if you can imagine it—along with the decaying cadavers of men killed in battle, over the castle walls with the intention of spreading illness. But the attackers gave up after five months and that siege failed."

"But it hadn't been from lack of trying," Dave said, and Mac laughed.

"Two thousand cartloads of the stuff," he said to himself, and he started laughing, too.

"In the New World," Mac continued, "the Spanish, Portuguese, and English had no reservations when it came to using whatever means and tactics they could employ to subdue or obliterate the native populations.

"Pizarro is said to have made gifts of smallpox infected blankets to Indians in South America, and General Jeffery Amherst, in whose honor Amherst, Massachusetts and Amherst College are both named, wrote a letter to one of his officers, Colonel Henry Bouquet, rendering advice on making gifts of smallpox infected blankets, handkerchiefs, and clothing that had come from smallpox victims in their infirmary, to the Delaware Indians, to hasten the spread of the disease which was particularly deadly among the native peoples. This started an epidemic of smallpox that decimated the Delaware and other tribes who came into contact with them. In fact, decimate isn't a strong enough word, since its literal meaning is 'one in ten.' It nearly obliterated them.

General Jeffery Amherst, in whose honor Amherst, Massachusetts and Amherst College are both named, wrote a letter to one of his officers, Colonel Henry Bouquet, rendering advice on making gifts of smallpox infected blankets, handkerchiefs, and clothing that had come from smallpox victims in their infirmary, to the Delaware Indians, to hasten the spread of the disease which was particularly deadly among the native peoples.

"Amherst also made favorable comments concerning Bouquet's plans to hunt Indians down using war dogs. And later he would bemoan that the English didn't have enough war dogs

to effectively pursue what he referred to as the 'Spanish Method' of killing Indians.

"But it wasn't only Indians against whom the English used smallpox as a weapon. During the siege at Boston, just prior to the Revolutionary War, the British could have defeated the colonists by landing troops behind the Colonial position where they waited before the Battle of Bunker Hill. But they considered it an ungentlemanly tactic to do so. Thus, they lost the battle. But before departing by ships for New York, they had no reservations about introducing smallpox among the citizens, hoping to infect the forces of the Continental Army. However, this tactic failed because the Americans, upon reentering the city, saw the disease for what it was and immediately quarantined those who had it and stopped its spread."

"So ungentlemanly tactics were frowned upon at the time, but biological warfare inflicted on the citizens was not," Dave said.

"That's right," Mac said. "What's acceptable is often just what's acceptable at the time. Another thing the British objected to was the way American snipers picked off the British officers. It was okay for the troops to die, but..."

"I get the picture," Dave said.

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"And the British may have used the same tactic, again, during the American siege of Quebec where smallpox spread through the ranks of the Continental soldiers and was a major contribution in the American defeat there."

"Weren't the British afraid of contracting the disease themselves?" I asked.

"Well, even though Edward Jenner hadn't yet invented his smallpox vaccine, which was made from the pustules of cattle infected with cowpox, it was understood that if you exposed people to the pus from mild cases of smallpox, you could confer a certain amount of immunity on the recipients. The British Army had already made it a common practice to inoculate their troops in this way."

"Oh, and it worked?" I asked.

"Yeah, it worked pretty well, though sometimes those inoculated

this way developed deadly cases of the disease.”

“And this too was done without realizing that it was microbes causing the disease,” Dave said.

“That’s right,” Mac said. “And if we fast-forward to the 20th century, when the role of viral and bacterial pathogens in the spread of many diseases was understood, it wasn’t long before someone used this knowledge to create biological weapons.

...the very first recorded use of chemical warfare in North America took place in 1623 when the Jamestown colonists invited an Indian leader named Chiskiak, along with his family and some two-hundred members of his tribe, for treaty talks and a feast. The colonists offered toasts of eternal friendship and fed their guests. But, what they had done was to poison the food and drink they served to the Indians.

“During World War I the Germans attempted to spread livestock diseases, such as glanders and anthrax, among horses, mules, sheep, and cattle to upset the Allies food supplies. And, you’ve got to realize, even as late as World War II horses and mules were still used to transport supplies along the battle fronts. So anything that killed or maimed the animals offered a tactical advantage. However, the attempt had little success.”

“In the meantime, the Germans brought a new type of weapon to the battlefield. This was the chemical weapon. Specifically, mustard gas.”

“Is this the first use of chemical weapons in history?” I asked.

“Not at all. The first *recorded* use of chemical weapons was in 600 BC when Solon, the legislator of Athens, used hellebores—hellebore is a toxic plant—to contaminate the River Pleithenes. Drinking from the river

gave the defenders of Kirrha explosive diarrhea making them unable to fight. The Athenians kicked their butts.”

“Later, during the Peloponnesian War, the Spartans created sulphur dioxide, a toxic gas, by burning wood saturated with pitch, naphtha, and sulphur. They used it during the siege of Platea, Pelium, and other cites that were allies to the Athenians.

“Then, around 200 BC, the Carthaginians did poorly in a battle and before their retreat, they left behind wine they had poisoned with mandragora, a root that contains a narcotic. Their enemy drank the wine, the narcotic took affect, they fell into a sleep, and the Carthaginians came back and slaughtered them all while they were unconscious.

“By the way, the very first recorded use of chemical warfare in North America took place in 1623 when the Jamestown colonists invited an Indian leader named Chiskiak, along with his family and some two-hundred members of his tribe, for treaty talks and a feast. The colonists offered toasts of eternal friendship and fed their guests. But, what they had done was to poison the food and drink they served to the Indians. And before the ‘feast’ was over Chiskiak, his family, and two-hundred others from his tribe were dead.

“And this wasn’t an isolated case. Some territorial newspapers in the Old West advised settlers on how to leave strychnine-laced food near Indian trails so that Indians could be exterminated. One newspaper boasted of the manner in which Minnesota settlers had poisoned over 100 Indians. The article described the efficiency and lower cost of the poison as compared to the cost of gunpowder and lead.”

“Why did we finally decide to outlaw the use of these weapons?” Dave asked.

“It came about as a result of their use in World War I. There were 1.3

million battlefield casualties from them including 90,000 deaths. The Geneva Protocol of 1925 prohibited the use of bacteriological and chemical weapons, but not the research and development of them.”

“Sounds like a Catch-22 clause,” Dave said.

“That’s right. So, despite the fact that everyone agreed they wouldn’t use them again, many countries still engaged in research and development of them.”

In 1422, forces attacking Karlstein, in Bohemia, catapulted animal manure—roughly 2,000 cartloads of it, if you can imagine it—along with the decaying cadavers of men killed in battle, over the castle walls with the intention of spreading illness.

“But no one used them in World War II,” I said.

“That’s not true,” Mac responded. “In WW II the Japanese, who were not signatories to the Geneva Protocol, killed as many as 10,000 people in Manchuria while developing various disease agents, including anthrax, cholera, typhoid, and plague. Later, during the war in China, hundreds of thousands of Chinese civilians fell victim to these diseases as Japanese aircraft dropped paper bags filled with plague-infested fleas over the cities of Ningbo and Quzhou in Zhejiang province.

“In other attacks they contaminated wells and, echoing what the English and Americans did to Indians, they distributed poisoned foods.

“One of the little known weapons used by the Japanese during World War II were balloon bombs. The balloons, which were launched from Japan, carried explosives and incendiaries. Over a 17-month period these bombs fell as far north as Canada and south as far as Mexico,

In WW II the Japanese, who were not signatories to the Geneva Protocol, killed as many as 10,000 people in Manchuria while developing various disease agents, including anthrax, cholera, typhoid, and plague. Later, during the war in China, hundreds of thousands of Chinese civilians fell victim to these diseases as Japanese aircraft dropped paper bags filled with plague-infested fleas over the cities of Ningbo and Quzhou in Zhejiang province.

and from California to points east of the Mississippi River.

"Their intent was to cause damage and to demoralize the Americans on the home front.

"The Japanese figured that, because the United States is an open society, the bombs would be newsworthy stories and, by eavesdropping on radio transmissions, they could learn how effective they were. But that didn't happen because whenever an American reported one, the FBI or some other agency showed up and threatened the citizen with treason and arrest if they talked about it. The result was that there was a virtual news blackout of the incidents.

The Iraqis and the North Koreans, for instance, could do a whole lot more saber rattling with a few good canisters of weapons-grade smallpox than they could do with a transport-ship-load of conventional 500-pound bombs.

"But what the Americans feared most wasn't the explosives and incendiaries the balloons carried; we feared that the Japanese would use them to launch biological and chemical attacks against us. But not only were the Japanese never sure the balloons were actually reaching us, they

also never succeeded in producing more effective biological munitions they could deploy for battlefield use. So the threat never materialized.

"After that war, despite an announced intention of not using them during the Cold War, both the United States and the Soviet Union researched the use of hundreds of different bacteria, viruses, and biological toxins and both countries developed sophisticated delivery systems to disperse them as fine-mist aerosols, packages that were to be included as part of bombs, or to be carried inside missiles.

"In 1969, we, the United States, conducted war games on ships loaded with animals and proved to ourselves that the weapons would work very well, even in a naval environment. In the meantime, Soviet ships lurked in the background and collected samples of the pathogens we used in that exercise.

"Then, in 1979, the United States ended its biological weapons program and we destroyed—or, at least said we destroyed—our stocks of pathogens.

Outlawing biological and chemical weapons

"Was it really for humanitarian reasons that we've outlawed these weapons?" Dave asked.



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"First of all, they aren't outlawed. What's outlawed is *first use* of them. We've maintained, as have other countries, that if they're used against us, we may strike back with them.

...this isn't just a Muslim thing. Christians have done it, Americans have done it, our Founding Fathers had done it. It's a human thing. We really have something to fear here, because the terrorists are human, regardless of how we otherwise may wish to think of them. And that thought should leave us quaking in our boots.

"As to the humanitarianism of it all: There may have been some humanitarian thought involved when the Geneva Protocol of 1925 was drawn up, but I'd say not much. Countries willing to fight wars with napalm,

machine guns, high-yield blockbusters, and who have in reserve, as this and several other countries do, a stock of nuclear warheads, is not concerned with humane ways of killing.”

“So you think these weapons were outlawed for other reasons,” Dave said.

“Yes, there were more practical reasons for outlawing them, but we’ve cloaked our excuses in humanitarian wrapping to hide those reasons. It’s something politicians love to do.”

“So what are the reasons?” Dave asked.

“There are a few main reasons, and probably a bunch of ancillary reasons. But two very good reasons are, first: these weapons are unpredictable. If the wind changes, poison gases can come back on your own troops. This was something that happened to the Germans in World War I. Generals don’t like that. Your own troops can panic if you misuse them.

“Biological weapons can have the same effect. You might spread a virus in a foreign country but, if it’s a contagious disease like smallpox, you may find it spreads beyond that country’s borders, the way influenza does, and spreads back to your own. You might even spread a genetically altered pathogen on a battlefield and not be able to protect your own troops from it. This alone may prevent you from occupying the land you’ve won.”

He paused.

“So that’s the unpredictable side,” I said.

“Yes. Second: biological and chemical weapons are the poor man’s atom bomb. Outlawing them forces Third World countries to fight wars with conventional weapons. Fighting a conventional war is vastly more expensive because the weapons we fight those with must be deployed in far larger numbers, and they require expensive delivery systems.”

“Like field artillery, fighter bombers, and cruise weapons,” Dave said.

“Yes. Plus, those delivery systems are much easier to find,” Mac said. “A canister of some biological agent smuggled into the country of your enemy would be harder to detect than a B-52 bomber.

“Then there’s the problem that the conventional weapons Third World countries can afford are considerably less effective than some of the high-tech biologicals and chemical weapons they could either develop or purchase on the world’s weapons market.

“The Iraqis and the North Koreans, for instance, could do a whole lot more saber rattling with a few good canisters of weapons-grade smallpox than they could do with a transport-ship-load of conventional 500-pound bombs. In fact, it’s conceivable that all of our high-tech weaponry could be countered with just one high-tech pathogen. And that’s the fear we have. We have hundreds of billions of dollars in conventional arms that we can press on Iraq or anyone else. What if Saddam Hussein said he’d strike back with a dozen canisters of genetically altered smallpox that he had hidden in this country—and he proved he had already put them here? Suddenly, the world’s greatest superpower has been trumped with a few thousand dollars.”

“I get the picture,” Dave said.

“So, we don’t want any two-bit dictator to have anything like that.

“And hence the problem with terrorists. All of the things that make them attractive to Third World countries may make them the weapons of choice for terrorists.”

“Would terrorists use nerve gas or smallpox to attack us?” I asked.

“Consider this: during the eight-year Iraq-Iran war the Iraqis used ‘banned’ chemical weapons on the Iranians. They also used them on the Kurds. And there was no hue and cry

from Moslem countries—neither those with theocratic governments nor those with secular governments—to take Saddam Hussein to task for it. To them, and to many other countries, biological and chemical weapons are just...weapons. Just as napalm and smart bombs are ‘just weapons’ to us.

“So to believe they will not use them, or, more so, to think terrorists won’t use them, we would have to believe they are our moral superiors. And there’s no reason to think this. In fact, they show every indication of being just like us, that is, human. And given the record of how humans have treated each other throughout history, this isn’t just a Muslim thing. Christians have done it, Americans have done it, our Founding Fathers had done it. It’s a human thing. We really have something to fear here, because the terrorists *are* human, regardless of how we otherwise may wish to think of them. And that thought should leave us quaking in our boots.

“However, there’s still another thing to consider. Unlike kamikaze attacks or suicide bombings, one of the things today’s Muslim terrorists are going to have to consider is: Is it worth releasing some kind of pathogen to infect us, their perceived enemy, even if it means the disease may spread back to their homelands and kill their own people wholesale? And, given today’s rapid travel, it’s entirely likely that that would happen.”

“Do you think they would?” Dave asked.

“Yes, some would.”

No one said anything for a minute or so.

“Would we be as susceptible to an epidemic, especially one with a genetically altered pathogen, as the Native Americans were?” I finally asked.

“Of course not. Today we know of things that neither the Indians nor their European contemporaries knew

of. We know how pathogens are spread, we understand hygiene, quarantine, and medical strategies.

"Still, a man-made epidemic, especially one made with genetically-altered pathogens, for which there is currently no vaccine, could be devastating. It could kill a lot of people. Maybe millions. But we wouldn't be as helpless as the Indians of two or more centuries ago were.

"But there's still more to consider than casualty numbers. An attack like that would be devastating to us psychologically, even if it didn't kill that many."

"How?" I asked.

"One of my greatest fears is what we would do to ourselves to gain the illusion of security."

"What do you mean?" I asked.

"We're gradually divesting ourselves of our freedoms in the belief that by doing so we're going to make ourselves safer from violent criminals, drug dealers, school shootings, poverty, pornography, and now terrorism.

"Of course, the fact is we still have crime, drugs, shootings, poverty, etc., and we'll still have terrorism, no matter how many of our rights we surrender."

"What's the solution?" Dave asked.

"The solution?" Mac asked.

"Yes, what do we do about the threat of biological and chemical weapons being used against us? Also, what's the solution for the threat these weapons have on our rights?"

"The solution has several sides. One is that we shouldn't give up any of our rights for any reason. Giving them up hasn't worked before. If these guys in Washington, D.C., can't do their jobs and fight terrorism without trampling on the one thing that makes us unique among nations—our rights, then let's send them packing. Let them get jobs pumping gas or whatever it is they're good at, and let someone who can do the job right take over.

"Second, we should demand back the rights we've already surrendered under other protectionist schemes that have come out of Washington, the RICO Act, for example. I realize this doesn't exactly relate to the issue of biological and chemical weapons, but it's something we should be doing, anyway.

"The third thing is, get out of the Middle East. Stop playing the game that we're the world's policeman. We're not. We're going to make ourselves the target of more and more terrorists with causes if we insist on pushing our nose into everyone else's business.

"I've said it before. We should live up to the philosophy of 'Speak softly and carry a big stick.' If we stop meddling in the political affairs of the rest of the world, the terrorists will lose interest in us, just as they have no interest in the Danes, the Costa Ricans, or New Zealanders.

"But the corollary to this is: If we've been minding our business and someone strikes at us—I don't care if it's a terrorist organization or another country—we should strike back immediately and decisively. Let others on this planet know that minding our own business doesn't mean we'll be patsies for them. Forget getting United Nations permission. Forget the hand wringing. Just do it. The last thing this country needs, if someone threatens us, bombs us, or commits terrorist acts against us, is to get the permission of the French, the Germans, the Russians, or anyone else.

"Let the world know that no one has anything to fear from us—unless they give us a reason to come after them."

With that we just sort of sat there. Dave started going through the rest of his mail. I started going through more of the submissions.

Muriel walked in with a coffee cup. She handed it to Mac who smiled and thanked her as he took it.

Muriel left.

I looked at Dave. He looked at me. We both looked back at Mac.

"She never brings us coffee. How to you rate?" I asked.

Almost on cue, Muriel came back. She paused in the doorway and said, "He rates because he's more charming than you two."

Then she left, again.

Mac smiled. He sat back and sipped his coffee. Dave and I just shook our heads. Δ

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Traditional trail foods— transportable calories

By Brad Rohdenburg

Napoleon said that an army marches on its stomach. Frederick the Great defined an army as a

group of men who demanded daily feeding. One can imagine the nutritional problems of a large group on the move. Armies through the ages have tried everything from bottling snails to bringing along herds of livestock. It's difficult to keep mess kits and cooking equipment adequately clean under rugged field conditions, so illnesses were rampant. In most campaigns, more troops have been lost to sickness than to the enemy. Sometimes it was impossible to deliver food to the front line troops who needed it most. Hunger has ended many ambitions. The search for transportable calories, the "research and product development" of earlier armies, has finally resulted in the MRE. "MRE" stands for "Meal, Ready to Eat." In accordance with the Office of the Surgeon General's nutritional requirements as identified in Army Regulation 4025, Nutritional Standards for Operational Rations, they will survive a 100 foot drop from a helicopter with no parachute, endure inclement weather and survive temperature extremes from minus 60 degrees Fahrenheit to 120 degrees Fahrenheit and have a minimum shelf life of three years at 80 degrees F and last for six months at

100 degrees F. Now people on the move can have a meal on demand by carrying it with them. Mess kits and pots and pans have been eliminated. MREs set the current standard for

it.) And if you're buying your own MREs rather than having them issued by Uncle Sam, they're prohibitively expensive.

If you have a need for trail food—storable, transportable, convenient, affordable and palatable calories—maybe we can learn something from the old ways. Jerky, pemmican, hardtack, and parched corn are traditional travel rations that have passed the test of time. They are products that have been produced, relied on, and refined for centuries, even millennia. Just a touch of modern technology and convenience makes them even better today.

Jerky, pemmican, hardtack, and parched corn are ways to put game, livestock, wild berries, and garden produce by in times of plenty. Easily made, transported, and stored, they became frontier staples for travelers, hunters, and warriors. They are still excellent trail foods and emergency rations.

I take jerky, pemmican, hardtack, and parched corn along on wilderness trips.

Supplemented by some tea, salt, and rice and whatever I can catch or gather, I can exist pretty comfortably and feel healthy doing it. Even if I take more modern foods along as well, the historical perspective is fun. They're comforting to have in reserve, too, in case the bush plane doesn't show up on time, or the wind keeps your canoe ashore for a couple extra days. (Their only drawback as emergency



Eating pemmican on the mountain

traveling rations, but they aren't magic. Those who use them are encumbered and inconvenienced by the weight and bulk of plastic utensils, condiments, heaters and a remarkable amount of packaging. Having to cook them to make them appealing wastes time. (I know, they're designed to be eaten cold if necessary. Have a few dozen that way and then come back and tell me about



Parched corn is easy to make, stores well, and makes a great trail food.

rations is that I'm tempted to eat them before I'm truly hungry).

Jerky

Jerky is said to keep for years, but it's so good that around my house it's shelf life is usually measured in minutes. Here's my favorite recipe:

1½ lbs. very lean ground meat—
(Any meat that isn't fatty,
including fish and birds. Avoid
pork or bear.)
¼ cup soy
¼ cup Worcestershire sauce
1 tsp. Liquid Smoke
½ tsp. garlic powder
1 tsp. onion powder
1 tsp. black pepper

Combine all the marinade ingredients and pour over the meat. Refrigerate until the meat absorbs the solution. (Chilled meat is also firmer and easier to work with.) Roll the ground meat out and cut into strips about ¼-inch thick and an inch or two wide. The strips can then be dried either on plastic screens or in a food dehydrator. Our forebears often simply draped strips of meat over branches; they built a cool, smoky fire underneath to keep away flies if necessary.

Pemmican

At its simplest, pemmican is only powdered jerky bound together with melted fat. It tastes far better than it sounds. When you're working hard outdoors, especially in the cold, listen to your body. Pemmican will satisfy your craving for calories in ways that a candy bar won't. It's said to provide every essential but vitamin C. The concept of pemmi-

can was borrowed from the American Indians. It begins with lean meat, traditionally of bison, moose, elk, or deer. It was dried over a fire or in the sun and wind. The dried meat was ground and shredded between stones. Sometimes ground dried berries, nuts, or honey were added. Finally, melted fat and/or bone marrow grease were mixed in. Pemmican could be eaten as is, or made into a soup or stew. When available, mint leaves or wild onions could be added for flavor.

The Hudson's Bay Company bought pemmican from the Indians and later the Metis as the staple food of their fur brigades and established a standard of quality. It paid a premium for "sweet pemmican" made solely from the best of lean meats—preferably from bison cows and young bulls—and only bone marrow grease. Pemmican production became the most important industry on the high plains next to the fur trade.

Pemmican was originally stored in the stomach or intestines of animals. Indians shaped it into small round cakes. The Hudson's Bay Company specified that it be stored in 45-kg. green bison skin bags called "parfleches," sealed with tallow. As the parfleches dried they shrank, in effect vacuum-sealing themselves.

They would keep for years. During the fur trade, it was reckoned that pemmican was nutritionally worth four times its weight in meat. Hudson's Bay Company pemmican consisted of 50% dried meat and 50% fat/marrow.

"Modern" pemmican

Very dry jerky. Use deer, moose, caribou, or beef (not pork or bear).
Fresh beef suet. (the raw fat from around the kidneys and loins)
Any seedless dried fruit not preserved with sulfites (optional)

Cut the suet into chunks and render (melt) it over low heat, until it becomes a rich golden-brown liquid. Continue to heat until all moisture is removed. It's important to remove all water from the fat to prevent it from going rancid. Strain it and throw away the solids. Allow it to cool—it will turn white. This is tallow. Rendering twice will make the tallow harder and give it better keeping qualities. Tallow, when cooled, resembles candle wax in color and consistency. In fact, if you have any left over, it can be made into candles. Lewis and Clark took cotton wicking along with them for that purpose, and wrote their journals by the smokey light of tallow candles. Add some beeswax or paraffin to make them burn better.

In a blender, grind the dried meat to a powder. Chop or grind the dried fruits and mix them with the dried meat powder. (Many who have acquired the taste for pemmican, myself included, prefer it without any fruit.)

Heat the tallow again. Make sure it is as hot as it can get without smoking. (Smoking means burning.) Pour the tallow into the dried meat mixture, adding **just enough** to moisten the particles. If it's too cool you will have to use a lot of it to stick the mixture together and the pemmican will

be too rich and fatty. At this point, if the tallow is cooling down too quickly to allow it to soak in properly, you can microwave the whole mixture to warm it up.

Form the warm pemmican into blocks or bars or patties. Allow them to cool and wrap in waxed paper or store in plastic bags.

“Peanut butter” pemmican

If you can’t quite bring yourself to eat the real thing yet, try this substitute:

1 part jerky
1 part peanuts or pecans, unroasted
1 part raisins
1 part any seedless dried fruit(s) not preserved with sulfites—apples, peaches, blueberries, etc.

Peanut butter and honey, in a two-to-one ratio

Cayenne pepper, to taste (optional, but contrasts nicely with the sweet fruits and honey.)

Powder the jerky in a blender. Add fruit and nuts. Microwave honey and peanut butter to soften them, then blend them into the mixture. (Use less than you think you’ll need, just enough to bind everything together. If you get it wrong, it’s easier to add more peanut butter and honey than to add more of everything else.) Add cayenne pepper, working it in thoroughly. Store in plastic bags.

Hardtack

Essentially a very hard cracker, hardtack was the standard traveling fare for soldiers, sailors, and pioneers up through WWI. Originally made from only salt, flour, and a little water, it was universally despised. It was traditionally either dipped in coffee, or soaked in hot water and then fried in bacon drippings. This updated version is far more healthy and

tasty, and just as easy to store and transport.

2 cups fresh whole wheat flour
(Best if you grind it yourself—wheat berries lose nutritional value rapidly once ground.)
2 cups fresh corn meal (Again, best if you grind it yourself right before baking.)
½ cup wheat germ
½ cup rolled oats
1 Tbsp. brown sugar
1 Tbsp. salt
1¾ cups water

Mix dry ingredients thoroughly. Add water. Knead until moistened but not sticky. Roll ¼ inch thick. Cut into 3-inch squares or rounds. Place on ungreased cookie sheets. Score with a knife to facilitate breaking later. Bake at 350 degrees for 30 minutes. Can be stored indefinitely in an airtight container.

Parched corn

Corn was the staple grain on the American frontier for pioneers and Indians alike, as it was (and is) relatively easy to grow, harvest, and process without machinery. There are four basic types: flour, dent, flint, and sweet. All may be dried on the cob, and may then be stored indefinitely. If you want to go modern, then just buy frozen whole kernel corn at the grocery store and dehydrate it.

Parching corn makes these hard kernels softer for your teeth and much more digestible. It’s a lightweight, high energy food that was carried by Indian warriors and hunters. It was also considered a treat by pioneer children. It can be eaten as is, or ground and added to soups and stews. You’ll be surprised at how it revitalizes you.

Heat a small amount of butter or lard or oil in a skillet on low. Wipe the skillet with a paper towel so that only a thin coat remains—just enough to prevent the corn from sticking. Pour in enough dry kernels to almost cover the bottom of the pan. Stir constantly to prevent burning. The kernels are done when they swell and turn light to medium brown and begin to pop. It takes from about one to five minutes. Dump the corn out onto a plate lined with a paper towel to soak up any remaining oil or grease, then re-oil your skillet and do some more. Enough for a day will fit in a plastic bag in your pocket.



Four easy to make, easy to carry, and energy-packed trails foods, clockwise from left: parched corn, hardtack, pemmican, and jerky.

On your next outing, try traveling light. Jerky, pemmican, hardtack, and parched corn will keep you going all day, without utensils to clean, or trash to dispose of, or the need to stop and cook. For dinner, pemmican stewed with whatever greens or tubers you’ve foraged, thickened with parched corn and served with hardtack will give you a literal taste of days gone by. Δ

Preparedness for travelers

By Brad Rohdenburg

When the subject of preparedness comes up, do you think of having a stock of supplies in your kitchen pantry in case of a storm? Maybe a backpack in your office or the trunk of your car with the things you'd need until you could return home?

If you travel for business or pleasure, the concept is likely to apply to an unfamiliar city thousands of miles from home. Being ready for the unexpected while traveling will give you options you wouldn't otherwise have. Sometimes what might have been overwhelming becomes merely an inconvenience, or even an adventure.

So what should we anticipate? Consider what has affected travelers before us: natural disasters, transportation strikes, civil unrest, crime, epidemics, quarantines, terrorism, war. Things as common as snow, traffic jams, flight cancellations, or car accidents. Things as local as a bridge hit by a barge, a derailed commuter train, or a power outage. Things of magnitudes beyond our comprehension like the 1985 Mexico City earthquake, Mount St. Helens, the Mississippi flood of 1993, Chernobyl, the New England blizzard of 1978, the hurricane that killed 6,000 in Galveston in 1900, wars that involved the entire world.

Anything your imagination can conceive of, and even more things that it can't. Being prepared might not always be enough for every circumstance, but anything that improves your odds is better than nothing.

I once spent three days in the Nashville airport during a snow storm. There were no hotel rooms available at any price. Airport person-

nel provided hundreds of cots, but there weren't nearly enough to go around. The junk food from the kiosks in the terminal was gone within hours.

Immediately after hurricane Andrew, I was holed up in a Miami hotel room with no running water, watching from the balcony as looters smashed windows below. I ended up using water from the toilet tank. (Relax—I said the tank, not the bowl.)

I have acquaintances who were stranded at a ski resort in Utah when an avalanche closed the only road out.



Some of the things in my car: Insulated ground pad, sleeping bag, jumper cables, tow strap, fire extinguisher, first aid kit, flashlight, candle and matches, ice scraper, shovel, a pot for melting snow or storing water, and MREs.

During the New England blizzard of 1978, hundreds of people spent days in their cars on Rt. 128 around Boston. A friend was in a grocery store during the San Francisco earthquake of 1989. The roads and bridges to her home were destroyed. Another friend was trapped by a revolution in Guinea-Bissau—anarchy that didn't even make the news in a country that no one's heard of.

Tens of thousands of airline passengers on 9/11 were diverted to places without accommodations for them, and deplaned without their luggage. (Hearing about the hospitality they experienced in places like Gander, Newfoundland, restored some of my jaded faith in the nature of people.)

My family physician volunteered for a U.N. humanitarian mission to Congo. Rebels paid the hospital a visit, and he was the sole Caucasian survivor. (Hearing about that jaded my faith again.) He survived because he was alert to what was happening around him and prepared to act. Something that extreme will probably never happen to you. He didn't think it would ever happen to him, either.

As a gentleman from the destroyed city of Sarajevo said "War is like bad weather. It just comes."

When I read about disasters in the news, or watch them unfolding in living color on TV, I think about what those people would want if they could magically go back in time for a "do-over." What needs seem common to most times and places? Water first, usually. Then appropriate clothes, and then shelter and food. Sometimes medical help and protection.

General preparedness

Clothing is your first layer of shelter. Pack for what's expected, of course, but anticipate more. A trip might start in Miami and end in Fairbanks. Dress appropriately, not only for your destination, but for possible diversions along the way, unnatural weather extremes, heating or air conditioning problems, and extended stays.

Synthetics are warm and they dry quickly, but will do skin damage if they melt. (I'm a little paranoid about this as I've seen it happen.) Natural

fibers are a better choice if fire is a hazard—and it is in your car, mowing your lawn, starting a barbecue, or going to a nightclub.

Cotton is comfortable, but loses its insulating value if it gets wet, and it dries slowly. Wool provides some warmth even when wet, but gets heavy and some types are itchy. Silk combines the best attributes of both, and is my favorite first layer. It can be washed in a sink by hand at the end of a day, and will dry overnight—both you and your travel companions will appreciate that if your one-day trip becomes a five-day trip.

Impractical shoes are the biggest clothing mistake I see travelers making. I love the look of a woman in heels, for example, but the leggy girl of your dreams will wear on you pretty quickly when her feet start to hurt. Bring along something comfortable just in case there's walking to be done.

“Carry-on” preparedness

Airline travelers have the highest standard of resourcefulness to meet in order to be prepared. Not everything you'd like to have when things get difficult will fit in checked luggage, let alone in carry-on bags. The Transportation Security Administration (TSA), a government agency that helps terrorists by disarming the 282 million of us who *don't* want to go on a suicide ride (but that's another article), won't allow so much as a Swiss Army knife onboard. Before a recent international flight, even nail clippers and a book of matches were confiscated from me. An elderly woman behind me had her sewing needles taken. (Of course, if a weapon were ever needed by either a terrorist or a law-abiding citizen, one can always be improvised. So far, at least, a can of soup in a sock isn't illegal.)

Personally, I'm armed wherever it's legal for me to be so. Armed or not, don't attract attention to yourself by acting like easy prey. Behave confi-

dently but inconspicuously. In third-world countries, don't be a loud, rich American wearing expensive jewelry. Keep your wallet in a button-down pocket, and some of your money in a money belt or an ankle pouch. Make a copy of things like your passport information and keep it in a separate place. Ask your hotel's concierge about neighborhoods to avoid, and have them choose a taxi for you.

Ask for a room above the ground floor. Most problems can be avoided simply by being alert, but consider taking a self defense course.

When I fly somewhere, I feel naked without at least a pocket knife. It's permissible to take one in your checked baggage. If you have only carry-on luggage, an inexpensive one may be purchased at your destination. Use it while you're there, then make someone's day by giving it away when you leave. In any case, I take a small course-grit diamond sharpening stone. It's weight and bulk are negligible. If necessary, even a scrounged piece of metal or plastic could be sharpened.

Keep a bottle of water in your carry-on, and top it off it when opportunities arise. The collapsible kind takes up less space and won't slosh annoyingly if you squeeze the air out. I bring a water filter or iodine crystals, too. You might not always be able to get water out of a tap. Pack some lightweight, nutritious, compact food. You're still free to patronize restaurants if that's your choice, but you won't be forced to rely on them.

Ear plugs and an eye mask will help you get some sleep on a crowded bus or plane. Other essentials for my “carry-on survival kit” are a toothbrush and floss, sunscreen, sunglass-



Some of the things in my carry-on bag: Water bottle, food, candle and matches, LED headlamp, course-grit knife sharpener, iodine crystals to disinfect water.

es, one of those candles-in-a-can, disposable lighter, a small first-aid kit (if you take medication, bring extra), a tiny LED flashlight or headlamp, and above all else: a good book. Something like, oh, say, a *Backwoods Home Anthology*.

Terrorism

Terrorism is making headlines these days, although it's probably less likely than weather or petty crime to disrupt your vacation or business trip. According to a recent news show, many people are buying gas masks. The odds of needing one, however, are miniscule. Unless you have sophisticated detection devices, the odds of knowing *when* you need one are even more miniscule. Visible clouds of biological or nerve agents don't roll down the street like in the movies.

Even if you do have a genuine need for a gas mask, and know when it's necessary to wear it and when it's safe to remove it, and even if you are trained in its use, it still must be instantly available, properly fitted, and with fresh filters of the proper type. For agents that can be absorbed through the skin, special suits are also necessary. Your money can be better spent.

I once read that the greatest risks to an airline pilot on the job are traffic accidents during the drive to the airport, and hotel fires during the lay-over. The same probably holds true for most passengers.

Automobile preparedness

Operate your car as if your life depends on it, because it does. Drive with common sense and at sane speeds. Make sure the next car you buy is crashworthy. (Common sense and sane speeds only count for so much if you're in a cat-food can.) Wear your seat belt. Have a fire extinguisher and a first aid kit. Know where they are and how to use them.

A duffel in my car also contains a sleeping bag, insulated ground pad, saw, jumper cables, tow strap, first aid kit, flashlight, a pot for cooking or melting snow, an ice scraper, and a couple of MREs (the military meals, ready-to-eat). I have used all of those things. I replace the MREs every year. (Want to make friends with the neighborhood kids? Give them your old MRE's. They'll be fascinated by them.)

Throw in whatever's appropriate for changing seasons, forecasts, or local conditions. In winter I add a hat, mittens, boots, shovel, and snowshoes. A candle or two will keep a stalled car reasonably warm. Be careful with fire, of course, so the solution doesn't become worse than the problem. A cell phone can summon help and reassure family. Keep your car's gas tank as full as is practical—it costs the same as leaving it empty, and again that phrase: It gives you more options.

A bicycle in the trunk, with an air pump and a spare inner tube, is my favorite automotive insurance. Walking a few miles with anything to carry is a time-consuming ordeal. On a bike, twice as far with twice the load is a pleasant outing.

Hotels

When you check into a hotel, make it a habit to look at the fire escape route posted on the inside of your room's door. Then open your door and look at the route the way you will look at it at 3 a.m. when you've been suddenly roused from a sound sleep. Count the number of doors and corners to get to it in case darkness or smoke prevent you from being able to see. (Do the same thing, while we're at it, when you board a plane, ship, or train: familiarize yourself with the way out. Count the rows of seats to it so you could get there in the dark, and look at how the doors or hatches operate.)

Don't use elevators during a fire because a power failure may immobilize them. Smoke tends to hug the ceiling. If it becomes a problem, stay close to the floor. (So why are the fire exit signs at the tops of the doors?)

If a fire alarm sounds while you're in your room, feel the door. If it isn't hot and you don't see smoke or flames through the peephole, evacuate. Remember to take your room key in case you must retreat to your room again. If you can't open the door, fill the bathtub with water and seal openings that smoke may come through with soaked towels. Breaking windows might create a draft that brings smoke in, so it's a last resort. Sit tight if you're more than a couple of stories above the ground. Most fires are confined to a few rooms or floors. We have a natural fear of fire, but smoke and panic are usually the greater threats.

I suspect that for most of the readers of this magazine, the concept of being prepared isn't new. But I hope this article has stimulated some thought and encouraged you to be alert and resourceful. Above all, being prepared is an attitude. Δ

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Jackie Clay's basic "grab & git" emergency kits

When an emergency strikes that requires evacuation, that's not the time to start flinging items in the trunk of your car. Here are some suggestions for short and longer term evacuations. You'll want enough supplies to be comfortable, fed, and informed. **It is important for each member of the family, including babies to have his or her own emergency pack packed and readily available at all times in the event that you find yourselves having to flee separately.**

72-hour kit

This kit is contained in one large daypack. You can customize it for your family's individual needs.

Basic first aid kit for a family: Housed in a relatively small box or nylon pouch, this kit should include:

- 1 roll of 2-inch sterile gauze
- 1 roll of first aid tape
- a supply of any daily prescription medicine, kept fresh and current
- adhesive bandages, assorted sizes
- basic first aid pamphlet
- burn treatment, such as Burn Free
- small, sharp scissors
- tweezers and hypodermic needles to remove slivers or embedded glass
- iodine or tamed iodine
- pain and anti-inflammatory medication, such as aspirin, Tylenol III (with codeine), or children's pain, fever and anti-inflammatory medication, as needed

Clothing, food, water, sanitation (per person):

- 1 complete change of warm, sturdy clothes, including a set of lightweight thermal long johns
 - 1 extra pair of sturdy socks
 - space blanket
 - stocking hat
 - 2 large plastic garbage bags (can make a quick rain poncho, which also holds in body heat, as well as many other uses)
 - pocket knife
 - flashlight
 - canteen with aluminum cup
 - butane lighter
 - half dozen MREs (military "meals ready to eat") in combination with TV dinners that do not require refrigeration
 - 1 small Ziplock bag of dehydrated fruit
 - 1 roll of toilet paper with center roll removed to save space; flatten the roll
 - small bottle of dish soap (also used to wash up after exposure to potentially dangerous material)
 - half dozen high energy food bars
 - 1-liter sport bottle of drinking water
 - 1 washcloth (fold & place them all in a zip-lock plastic baggie with dish soap)
- (The rest are per family)
- fire starter blocks/sticks
 - stainless steel mixing bowl (doubles as wash basin, water boiling vessel and cooking utensil to boil food)
 - 9 volt radio with fresh battery
 - compact, basic fishing gear (i.e. coil of line, a few hooks and

universal lures (small), such as spinners, dry flies

- a few dollars in quarters and bills
- a small address book with phone numbers & other vital information
- a map of the local area

All of this can easily be packed into a large, soft-sided day pack. The heads of the family may also wish to include:

- a lightweight handgun and ammo for signaling and family protection
- a cell phone
- lightweight tent
- a small water filter

If at all possible, each member of the family should also include a very warm sleeping bag in their kit. It won't fit in the bag, but can be stuffed into a sack to carry and will be very welcome, especially in cold weather.

Adequate drinking and sanitation water is a must. It's best if you include at least five gallons of water, carried in the trunk of your vehicle; more is best for personal sanitation, especially after some sort of contamination (biological or other terrorist attack, chemical spill, etc.) This can be carried in a blue plastic water carrier or even several sturdy plastic jugs, such as milk comes in.

Above all, the family should have a PLAN for various scenarios:

- where they will meet
- who will do what
- bring what
- where they will go

People running around like chickens with their heads cut off are totally useless and likely to get into serious trouble.

Longer term evacuation needs

In addition to the above, have a secondary “grab and git” kit put together, should the situation look extremely serious, making a longer stay away from home necessary. I’ve found that this kit is most easily put together in large, inexpensive plastic coolers. It’s based on a family of four.

Food cooler #1

- 1 large Ziplock bag of dehydrated vegetables
- 1 lb. potato flakes
- 1 small Ziplock bag of dehydrated onions
- include small Ziplock bags of other dehydrated vegetables your family may like: peas, carrots, etc.
- 1 dozen cans of canned ham, tuna, chicken, etc.
- 1 dozen dry “instant noodle & rice mixes”
- large Ziplock bag of dehydrated eggs
- small Ziplock bag margarine powder
- small Ziplock bag cheese powder
- small Ziplock bags of dehydrated fruit (raisins, apples, apricots)
- 1 lb. each of dehydrated beef & chicken soup bases
- 2 lbs. dry noodles
- 1 lb. dry beans
- 2 lbs. macaroni
- 10 lbs. flour
- 3 lbs. can shortening
- 1 small can baking powder
- small Ziplock bag of salt
- spices
- 1 lb. sugar
- 3 lbs. rice
- 6 boxes instant pudding mixes
- 3 pkgs. each of potato pancake mix, soup mix, and pancake mix
- instant coffee, tea, or beverage mixes

- sugar substitute for diabetics
- 1 lb. cornmeal
- 3 lb. dehydrated milk if you have kids, otherwise, 1 lb.
- powdered formula if you have babies

Kitchen box in cooler #2

- frying pan
- large and small saucepans
- metal spatula
- matches & lighter
- fire starter blocks/sticks in addition to the ones in the 72-hour pack
- mixing bowl
- green dish-scrubber pad
- paper towels with cardboard roll removed
- bowls for entire family
- silverware for entire family
- roll of lightweight wire
- hatchet
- small propane stove & fuel tanks
- several candles
- large bottle of good dish detergent (also for washing hair, bathing and washing clothes)

Other gear:

(This would go in a large heavy-weight plastic storage box.)

- sleeping bags for each person
- Coleman lantern (for heat as well as light)
- extra mantles; sleeping bags protect lantern from breakage
- unopened gallon of Coleman fuel
- 10' x 12' plastic camo tarp
- medium-sized bow saw
- lightweight but family-sized tent
- warm jackets, gloves, and stocking hats for each person
- extra flashlight batteries (or a small solar charger and rechargeable batteries)
- small folding shovel or entrenching tool—the real military ones are best (for latrine duty, camp chores, digging out stuck vehicle)

Extended medical kit: (This would be packed in a large fishing

tackle box) Along with the basic medical items listed above, you might want to add some of the following:

- antidiarrheal
- oral antibiotics
- oral electrolytes for stress and dehydration
- thermometer
- comprehensive first aid book
- cold medicines (cough, runny nose, sore throat)
- cotton roll
- hemostats
- suturing material, if you are trained enough to use it safely
- ointments for athlete's foot, jock itch or vaginal yeast infections
- eye ointment or drops
- a dental kit to temporarily treat toothaches, replace fillings and mend broken dentures
- contraception, if appropriate

Your kit may include much more, depending on your needs and medical experience; ours includes casting material for broken limbs, scalpels, IV set and fluids and more.

A large new plastic garbage can is a great boon for water storage. They are not “food grade,” meant to hold drinking water, but they will conveniently hold dish and bathing water and are lightweight and easy to carry. You can even put a sack of dog food in it, unopened, for your best friend, too. One or more white plastic food grade buckets are also indispensable to carry water and other necessities.

We have found that having a small, cheap travel trailer makes packing more than this very easy. I emphasize “small” as this trailer is cheap to pull, inconspicuous when backed into a hole in the forest, and does not scream “MONEY,” as does a larger, nicer RV, especially during desperate times. Besides, it’s nice to grab and git, if only to go fishing for the weekend—just for a practice run, of course. Δ

THE IRREVERENT JOKE PAGE

(Believing it is important for people to be able to laugh at themselves, this is a continuing feature in *Backwoods Home Magazine*. We invite readers to submit any jokes you'd like to share to *BHM*, P.O. Box 712, Gold Beach, OR 97444. There is no payment for jokes used.)

I went to the store the other day, and I was in there for only about 5 minutes. When I came out there was a motorcycle cop writing a parking ticket. So I went up to him and said, "Come on, buddy, how about giving a girl a break?" He ignored me and continued writing the ticket. So I called him a pencil-necked Nazi. He glared at me and started writing another ticket for having worn tires! So I called him a horse's patootie. He finished the second ticket and put it on the windshield with the first. Then he started writing a third ticket! This went on for about 20 minutes. The more I abused him, the more tickets he wrote. But I didn't care. My car was parked around the corner.

WIFE: The two things I cook best are meat loaf and apple pie.

HUSBAND: Which is this?

There was a married couple who were in a terrible accident. The woman's face was burned severely. The doctor told the husband they couldn't graft any skin from her body because she was so skinny. The husband then donated some of his skin...however, the only place suitable to the doctor was from his buttocks. The husband requested that no one be told of this because it was, after all, a very delicate matter!

After the surgery was completed, everyone was astounded at the woman's new beauty. She looked more beautiful than she ever did before! All her friends and relatives just ranted and raved at her youthful beauty!

She was alone with her husband one day and she wanted to thank him for what he did. She said, "Dear, I just want to thank you for everything you did for me! There is no way I could ever repay you!"

He replied, "Oh don't worry, Honey. I get plenty thanks enough every time your mother comes over and kisses you on the cheek!"

On the first day of college, the Dean addressed the students, pointing out some of the rules:

"The female dormitory will be out-of-bounds for all male students, and the male dormitory to the female students. Anybody caught breaking this rule will be fined \$20 the first time."

He continued, "Anybody caught breaking this rule the second time will be fined \$60. Being caught a third time will cost you a fine of \$180. Are there any questions?"

At this point, a male student in the crowd inquired: "How much for a season pass?"

The contractor wrote on his clipboard, walked to the window, opened it and yelled out, "Green side up!" He then closed the window and continued following the woman to the next room. The woman looked confused, but proceeded with her tour. "In this room, I was thinking of an off blue," said the woman.

Again, the contractor wrote this down, went to the window, opened it and yelled out, "Green side up!"

This baffled the woman, but she was hesitant to say anything. In the next room, the woman said she would like it painted in a light rose color.

And once more, the contractor opened the window and yelled, "Green side up!"

Struck with curiosity, the woman mustered up the nerve to ask, "Why do you keep yelling 'Green side up' out my window every time I tell you the color I would like the room?"

The contractor replied, "Because I have a crew of blondes laying sod across the street."

Father O'Grady was saying his good-byes to the parishioners after his Sunday morning service as he always does when Mary Clancey came up to him in tears.

"What's bothering you so, dear?" inquired Father O'Grady.

"Oh, father, I've got terrible news," replied Mary.

"What is it, Mary?"

"Well, my husband, passed away last night, Father."

"Oh, Mary, that's terrible," he said, even though he knew her husband had not been easy to live with. "Tell me Mary, did he have any last requests?"

"Well, yes he did father," replied Mary.

"What did he ask, Mary?"

Mary replied, "He said, 'Please, Mary, put down the gun...'"

Ayoob on Firearms

IN TIME OF WAR: THE ISRAELI ANSWER TO TERRORISM

When war seems imminent, citizens think about protecting themselves. The war of the moment involves a declared enemy that has already used unconventional tactics to murder some three thousand innocent civilians within these borders. Closer to their own turf, they have a long and well-documented history of using terror tactics—mass shootings and suicide bombings—directed against innocent and unarmed women, children, and men rather than military targets.

We have seen the previews in Israel and Pakistan. We have seen them in captured Al-Qaeda training tapes. In one such tape, a carload of guerrillas is pulled over on what appears to be a four-lane highway. As a police officer approaches, the trunk lid pops open and he is sprayed with automatic weapons fire. One guerrilla walks up to the downed policeman's body and executes him with a head shot, then gets in the car and drives away with the rest of his band.

There are not a whole lot of four-lane highways in Afghanistan. It is clear that this is training for atrocities committed within the United States.

Early in the wake of September 11, 2001, the Israeli intelligence service Debka warned that Osama bin Laden had probably acquired at least four small, "dirty" nuclear devices, known as "suitcase nukes," from sources connected to the Russian Mafia. In a recent book, a researcher suggested that the Al-Qaeda arsenal of these devices might number more than 30. Given the history of other contraband brought into North America in ship

containers and by other smuggling routes, there is ample reason to believe that nuclear bombs are already in place here, waiting to be triggered by the fanatics who control them.

The problem is clear. It's time to look at solutions.

When homeland security hits home

Since 9/11, a popular bumper sticker has circulated among gun owners. It reads, "The Second Amendment Is Homeland Security." This is more than just empty rhetoric.

In the last two years especially, street terrorist attacks in Israel have repeatedly been shortstopped by armed Israeli citizens. A terrorist opens fire at a crowded bus stop; a passing Israeli motorist draws his 9mm pistol and cuts him down. A late-arriving security man with an M-16 hoses the twitching terrorist just to make sure.

Another terrorist attempts to trigger an explosive device in a public place. An Israeli housewife draws her pistol and shoots him dead before he can detonate the bomb. The would-be martyr dies alone.

A third terrorist opens fire with an automatic weapon in an Israeli school. What could have been a mass murder on the scale of Columbine or greater is limited to a very short casualty list when Israeli parents and grandparents, who have provided volunteer armed security after receiving state training, open fire and kill him with their concealed pistols.

Note that in each of these episodes, it was an armed citizen who stopped



Massad Ayoob

the terror. Not a soldier. Not a security guard. Not a police officer. Just as wolves do not try to seize a lamb under the nose of the sheepdog, terrorists do not strike where armed protectors are known to be present. They scout the turf and select their victims more carefully than that.

Israel began the program of armed citizen guards in the schools after the Maalot massacre in the 1970s, when a large number of children were slain in a terrorist incident. The volunteer parents work in plain clothes, armed with concealed semi-automatic pistols, and are trained by Israel's home guard. It is significant that in the more than a quarter century between Maalot and the incident mentioned above when the citizen guards shot down the terrorist in the school in 2002, not a single child was murdered in an Israeli school!



With current terrorism alerts, readiness for many will include being constantly armed, if only with a small handgun like this light S&W Titanium .38.

The reason is that Israel wisely publicized the fact that the civilian volunteer guards, indistinguishable from the regular teaching and administrative staff, would be in place. It served as a tremendously effective deterrent. No Moslem fanatic who wants to go to Allah as a successful warrior who has slain many infidels visualizes himself making the trip after having been shot down by some geriatric with a gun before completing his mission. Any head trip as arrogant as that of a self-styled martyr cannot tolerate the thought of an ignominious death at the hands of an ordinary victim. It would be like a wolf picturing its own throat being torn out by a sheep: simply unthinkable, and therefore a natural deterrent.

Of course, the politically correct hand-wringers want nothing to do with this. Sadly, being helpless themselves, sheep tend to instinctively fear anything with canine teeth. Many of them cannot distinguish between the wolf and the sheepdog, and thus fear them both equally. We have seen this phenomenon in the knee-jerk reaction against arming pilots, for example, in the wake of 9/11. Never mind that it

has worked remarkably well for the commercial air fleets of Israel and Russia in preventing hijackings. We have seen it in the adamant refusal of many to even think about armed protectors inside schools. Never mind that from Peru to the Philippines, as well as in Israel, institutional arming of school personnel or selected volunteers with appropriate training has put an end to murderous armed attacks on school grounds.

America's approach to its own fledgling Homeland Security program has been marked by some counterproductive decisions. I write this in Missouri, a couple of days after teaching a class to local police. I spent much of yesterday on the range, shooting with SWAT cops from the area.

Until 9/11, these officers had frequently trained at the Army's Fort Leonard Wood. They were grateful

for the opportunity, and considered it some of the best Special Weapons and Tactics training they had ever received. "Your tax dollars in action" in a very effective way.

Alas, shortly after September 11, these services to local police were cut off and military facilities were dedicated strictly to training the military. Certainly, when America's response to Al-Qaeda ramped up, it was necessary to take maximum advantage of extant facilities for training designated personnel. At the same time, however, are not the domestic police the first line against terrorism in a homeland security program? It was law enforcement, not military, who captured those Al-Qaeda operatives who were arrested in the United States and are now in custody. It was an Oklahoma state trooper, not SEAL Team Six or Delta Force, who captured the most infamous of home-grown terrorists, Timothy McVeigh, after the bombing of the Federal building in Oklahoma City.

Shutting off US Government training to the cops, the front-line troops in the Homeland Security effort, is not a good thing. It also gives you an idea where Federal support for self-reliant American citizens stands on the current list of official priorities.



The 1911 .45 automatic remains the quintessential American combat handgun. This one is the excellent, affordable Kimber Custom II.

“By their nature”: tools for the task

For decades, Israeli citizens in what Yanks would call “tough neighborhoods”—communes where there had been heavy terrorist activity—were allowed to check out Government-owned Uzi submachineguns. Are we going to see that in the United States? Not bloody likely. But, don’t worry about it. You probably aren’t going to need an Uzi.

The overwhelming majority of terrorist incidents in Israel that have been shortstopped by armed citizens have involved one particular type of defensive firearm: the 9mm semiautomatic pistol, usually with a high capacity magazine design. By its nature, the handgun is portable. It can always be with you when danger threatens without warning, and remember, by their nature terrorists strike without warning at times and in places where they know the attack will not be expected. By its nature, the handgun is concealable and invisible until deployed. Remember that by their nature, terrorists scope out their battleground before they initiate violence there, and make a point of

avoiding attack sites that are conspicuously well-defended. It’s that “wolf and sheepdog” thing again.

Fortunately, the last 15 years have seen a dramatic increase in the number of jurisdictions in which law-abiding private citizens in the United States can obtain a permit to carry a loaded and concealed handgun in public. The trend continues, with Missouri and some other states actively fielding legislation this year that would grant them the privilege. Given the profile of the threat, the timing is excellent.

A defensive firearm is a special purpose tool, and the selection of the tool must always be tailored to the task. The terrorists under discussion here seek target rich environments. Crowded schools. Crowded marketplaces. Crowded restaurants and nightclubs. This means that the private citizen engaging one in defense of himself and others will have a very

narrow “firing corridor” through which the rescuing gunfire will have to be delivered without harming any of the many innocent bystanders who will predictably be at the scene.

Anyone carrying a firearm that might remotely be used for this purpose should spend plenty of time training in what is often



In use by counter-terrorist groups world wide, the Glock 17 holds 18 rounds of 9mm in pre-ban magazines. Author strongly recommends high speed hollow point ammo if 9mm is chosen.

called “surgical” shooting. The sights on the pistol should be true, that is, the gun should be perfectly sighted in to deliver the bullet’s point of impact exactly to the handgun’s point of aim.

We are talking about hitting very small body parts to instantly shut off the lethal danger which the target organism poses to a large group of innocent humans. A shot to the chest may not be enough. A man shot through the lung can stay up and running for a considerable period of time. If the brain is fully oxygenated, even a man whose cardiac function has been completely shut off by a bullet through the heart (and not every gunshot wound of the heart will shut that organ down completely) can continue purposeful, violent activity for as much as 14 or 15 seconds.

A shot to the upper central nervous system is more certain to stop violent activity immediately, but is also much more difficult to deliver. The spinal cord is only about as thick as its owner’s little finger, and is encased in a serpentine column of bone. Even a shot to the brain is not 100% guaranteed to instantly shut off the action. The only certain “instant one shot stop” is a hit to the stem area of the brain, which destroys the medulla oblongata or pons. This is in line with the ears when aimed at from



More cops are carrying guns off duty than ever with current terrorism alerts. Here, author has been practicing “surgical” brain shots with a Kimber .45.



"Old-fashioned" service revolvers have the match-grade accuracy for surgical rescue shooting in capable hands. This is S&W's classic Combat Masterpiece .38 Special, with Remington +P 125 grain hollow points in a Safariland speedloader.

the side, and with the base of the skull when the shot must be fired from behind. The external anatomic landmark for a frontal shot will vary depending upon the position of the head.

If the head is erect in the normal posture, the deep brain target will lie directly behind the nose. If the head is forward in an aggressive posture, the level of the eye sockets will be in line with the primal brain target that must be hit. If the head is thrown back as in a triumphant shout, aiming through the mouth will guide the bullet to the brain stem.

The 9mm pistol has become virtually standard among civilians in Israel. However, that does not make it the best choice. Anecdotal reports of shootings of terrorists there by citizens and by police and soldiers (who have also standardized on the 9mm handgun) frequently show the bad guy to take many hits before he goes down. This is why the high capacity gun has become the 9mm of choice there. The most common brands are the old classic Browning, the Beretta, the Glock, and the Jericho (an Israeli-made clone of the Czech CZ75 design). One cannot help but notice a corollary fact: the high performance hollow point bullets that brought the 9mm Luger cartridge up off its knees

and made it an acceptable fighting round are thin on the ground in Israel. Many citizens and police are likely to carry military style full metal jacket ("ball") ammunition. This stuff tends to just punch through the body, making little dimpled holes like ice-pick wounds

and endangering those behind the target with exiting bullets.

Recent events in Afghanistan have shown the relative impotence of 9mm ball compared to the same style of .45 caliber ammunition that has been in historical evidence since before WWI. GIs in Afghanistan report that Al-Qaeda fighters are absorbing multiple 9mm ball rounds from the issue Berettas before going down, but tend to drop to one or two solid hits with .45 ball fired from the old 1911 style guns still in use by Delta Force.

The medium-caliber handgun cartridge such as the 9mm (.355" bullet diameter) or the .38 Special (.357" bullet diameter) requires an expanding bullet to best do its job of stopping human assault, while the .45 (.452" bullet diameter) has a long history of shutting off attacks with ball type ammo. Take a quick look at three US shootouts reported in the *Armed Citizen* column of the National Rifle Association's new magazine, *Women's Outlook*.

Case One: Finding a home

invader in the bedroom of his 18-month-old son, Ronald Dixon "pulled a 9mm handgun out of his closet and confronted the stranger in the child's room. When the interloper advanced on him, Dixon fired his gun, hitting the man twice. The intruder, later identified by police as Ivan Thompson, then fell down the stairs and ran out of the house, but collapsed outside. According to police, Thompson has a record of 19 arrests, mostly for burglary. He was critically wounded in the chest and groin." (*New York Daily News*, 12/15/02.)

Case Two: US Marine Corps Sgt. James Lowery was at the drive-in window of a McDonalds in Gardendale, Alabama, while home on leave. "That's when a man with a .38-cal. handgun ordered him out of his customized Chevy suburban. Lowery complied and got out of his SUV, but the man then shot the Marine in the face. Lowery reached back into his vehicle, drew a .45-cal. pistol and shot his assailant several times. The robber, Thaddeus Antone, was pronounced dead at the scene. Lowery was listed in fair condition at a local hospital." (*Birmingham News*, 12/19/02.)

Case Three: Medgar Flowers was home alone with his wife when two armed home invaders entered shooting. Flowers struggled with one of them and finally the homeowner got close enough to the coffee table where he kept his own 9mm automatic. "Flowers was able to retrieve his



In every caliber, author recommends hollow point bullets for safety to bystanders.

gun and fired several times at the intruder. 'I didn't even know if I had hit him,' he said. 'There was no blood, and he never fell. It was like I hadn't shot him.' The struggle ended when Flowers' tormentor stumbled out of the house and died a short time later. The second gunman was not found." (*Baton Rouge Morning Advocate*, 01/04/03.)

Note that the Marine's .45 decisively ended the encounter in his favor. Note that the man shot in the face with a .38 responded by killing the man who shot him, and that two criminals shot with 9mms were able to perform considerable physical activity before collapsing of their wounds. Cowardly predators surprised at being shot in self-defense, they chose flight instead of fight. A committed, fanatical terrorist would be more likely to keep fighting and shoot innocent victims or trigger an explosive device before collapsing.

In a scenario where terrorism has struck the United States hard and ammunition is no longer readily available in stores, inexpensive "ball" ammunition, stocked in quantity for customers who practice with it extensively, will be the last to disappear from the shelves. Ball ammo in a .45 will probably get the job done; ball ammo in a .38 or 9mm often will not.

In any case, all such handguns should be loaded with expanding-bullet hollowpoint ammunition that is designed to stay in the body of the offender and not exit to strike an innocent bystander hidden from view behind him. While exotic high speed, low bullet weight, frangible projectiles can be had, they are too expensive to practice with, they often do not hit to point of aim, and quality control and accuracy are iffy with some brands.

Even a small .38 Special revolver is better than nothing when lethal danger threatens. Snub-nosed revolvers are harder to shoot than larger guns. With a full size service revolver, sur-



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gical accuracy is absolutely possible in trained and confident hands. With a small frame snub-nose, the shooter will often have to get closer to make an accurate precision shot. However, in some of our more tropical climates, it's carry a very small gun or carry nothing at all.

Bottom line

Our government has sent us a very clear message: Be Prepared. There is every reason to believe that more terrorist activity will take place in the

American homeland. No, a pistol is no defense against a nuclear device that detonates downtown. But looking to the Israeli model tells us that the same monsters they have fought will be fighting us the same way.

Santayana was right. "Those who ignore history are doomed to repeat it." Δ

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The home citrus orchard

By Anita Evangelista

It may seem like an impossible dream if you live outside of southern Florida, California, or Texas, but you can grow a home “backyard” orchard of oranges, lemons, limes, grapefruit, and exotic citrus even in the coldest climates. These attractive small trees provide a bounty of luscious fresh fruits, beautiful and intensely fragrant flowers, and lush glossy foliage. Best of all, growing these potted charmers is as easy as raising any houseplant.

I’ve grown various types of potted citrus trees for over 18 years, starting with a tiny twig of a lemon that had only five leaves on it. Today, that little tree has moved from California to Missouri, died back to the roots two times (when it was accidentally left out in the snow), and has produced in excess of 200 normal-sized lemons. We’ve had it so long, it seems like a member of the family. Over the years, we have added oranges, limes, kumquats, “Mandarinquats,” and a little satsuma (a fragrant Japanese mandarin). The nice thing about citrus trees is that no matter which variety you choose, they have the same straightforward growth and care requirements. If you have ever raised a persnickety houseplant, you will be pleasantly surprised at how easy-going and tolerant citrus can be. The bounty, of course, is that they also provide you with fresh fruit loaded with vitamin-C during the deepest, darkest part of the winter.

Know your trees

Citrus trees are native to some of the world’s warmest and most-pleasant climates, subtropical and tropical India and China. The fruit has been domesticated for thousands of years,

and plantings have been made all over the warmer parts of the world, including Spain, Portugal, Brazil, the Caribbean, the Mediterranean, and Asia. It is grown as a houseplant on the rest of the globe. Even nurseries in England’s non-tropical climate offer a wide assortment of varieties.

The familiar sweet orange is the most widely grown species of citrus. It was brought to the New World by Columbus in 1493, and planted for the first time in Hispaniola. By 1565, Spanish explorers had established orange orchards in Florida.



One of two yellow-fleshed grapefruit on a tiny 2-branch tree.

The most commonly-planted backyard variety of orange is the Valencia, a “juice-type” that may have a few seeds. The Navel orange, a seedless type that occurred as a “sport” or natural mutation, is also readily available as a potted plant. Navels are excellent for fresh eating and for juicing, although the juice can become bitter several hours after being squeezed. “Blood” oranges have bright red flesh and a tangy, sprightly flavor. Oranges grown in the constant warmth of a modern home will be thin-skinned and yellowish, while those that are exposed to cooler temperatures out-



Thin skinned Meyer lemons soaking up the sun in a south-facing window.

doors into the 40’s, will form a thicker skin and brighter orange color. Blood oranges need cooler weather to develop their deep red flesh coloration. If kept in warmer conditions, the flesh may be merely speckled with red. Fruit matures from November to March and can be picked when they have developed some orange coloration, but will hold on the tree for months. Valencia fruit will “regreen” after winter is over, and can hold on the tree until early summer. Some orange varieties drop their fruit when they have over-ripened. Most potted oranges (and many other citrus varieties) are grafted onto “sour orange” rootstock, the hardiest type.

Lemons are the most productive of the planter-grown citrus. Some varieties grow extra-large on small bush-like trees, others produce flowers and fruit simultaneously. Eureka lemons are the familiar supermarket type, while Meyers are larger and have thinner skins. Lemons hold fairly well on the tree, and ripen over a long

enough period of time that you can have fresh fruit through most of the spring and early summer for those ice teas and meringue pies.

Limes are commonly found in two varieties: "Key" (or "Mexican") and "Persian." Key limes are the ones made famous by the summer Key lime pie. The limes are small 1" fruit with an intense limey flavor and powerful aroma. They are picked while still green, although when they ripen to yellow, they still retain the wonderful lime taste and scent. Persian limes are shaped like small, flattened oranges. The flavor is less intense and somewhat smoother than Key limes, and they produce more juice than Keys for drinks or marinades. Like Key limes, they are used when still green, but will ripen through fall and winter to a pretty orange shade, though they still taste like mellow limes.

Grapefruit can be found as yellow-fleshed or red-fleshed varieties. Yellow-fleshed have a stronger, more bitter flavor and more juice, while the red-fleshed types are mildly sweeter and less acidic. Fruit grow very large, even on tiny spindly trees, and branches may need to be propped up to prevent cracking. Ripening is in fall through early spring.

Kumquats and their variants such as "Mandarinquats" are fast-growing highly productive trees. The fruit is tiny, about 1" across and bright orange colored. The flesh is also orange. Each fruit will have several seeds. Interestingly, kumquats have a sweet, tangy skin and somewhat sharp and bitter flavored flesh. The best way to enjoy these unusual fruits is directly off the tree. Just pop one in your mouth for an intense and juicy treat! These trees are able to bear almost year-around, and will often be covered with small, fragrant blossoms and fruit at the same time. It's not unusual for our 4' tall tree to have over 100 fruits ripening on it.

Mandarins are similar to oranges in coloration, and the fruit "sections" and peels easily. Supermarkets carry these 2", flattened specialty fruit around winter holidays, and offer them as "Clementines." Aside from their fresh-eating qualities, Mandarins can be used as an unusual decoration. Cut the fruit in half at the equator and remove the sections carefully so that the central white pith is left behind. Gently apply a few drops of cooking oil to the inside of the peel and smooth up along the pith. The pith can then be lit like a candle wick and will burn slowly due to the oil, releasing a gentle fruity scent. Mandarins ripen in the fall and winter months. They are more cold sensitive than oranges.

Growth and care

Potted citrus typically won't grow more than four or five feet high, though most remain less than 24" tall. Kumquats form a straight, upright trunk, while oranges, lemons, and grapefruit tend to be bushy, and a single plant can spread three feet wide in a lush canopy of glossy leaves. Plants can come to you bareroot, in small planters, or in standard planters. Most of my trees are in 5-gallon black plastic planters. This seems to be a good size that is large enough for healthy roots, and small enough to be moved around when needed. Larger pots, 7-10-gallon size, will allow your trees to grow a little bigger, but might make moving the plants a real ordeal.

Citrus trees require lots of sunlight. During the warm months when there is no risk of frost, trees can be moved to the outdoors on the south side of your home. They will soak up the sun, and after the dark indoor months, they will burst forth with sudden new growth. In the cold months, the trees will do well in a greenhouse, in a south-facing window, or under a "grow lamp." Your trees will do better if you prepare them for the trip indoors by shading them during part



Persian limes ripen to a bright orange shade.

of the day in the autumn. The sudden change from outdoors to indoors may cause some leaf-drop. Typical indoor temperatures are fine for these trees during the winter. In the early spring, the trees appreciate being gradually hardened off to the outside weather by daily trips outdoors during the daylight hours. Bring them in at night if there is a chance of frost.

All citrus are frost-sensitive to some degree. Leaves and stems can tolerate temperatures into the high 20s, but fruit will be damaged by freezing. The potted lemon tree that we forgot out in the snow died all the way back to the soil surface. We thought it was a goner! We trimmed the dead-looking plant back to the central stem, and just waited. Lo and behold, it started to grow again two months later in the spring. Now, 10 years later, it has 14 fat lemons ripening on its healthy branches.

Citrus trees don't require any pruning, except perhaps for a little shaping and trimming of any dead or cold-killed wood. The natural form is compact and attractive. It is not necessary to mulch container-grown trees and might actually contribute to "foot rot," a type of root rot that eventually kills trees. These plants all prefer a planting mix of equal parts sand, peat, and bark (or perlite/vermiculite). This forms a firm but loose planting medium that will permit

good drainage. Drainage holes of the container should be covered with screen mesh to prevent loss of the medium, then coarse gravel laid over the screen. The planting medium should then be placed in the pot to about one fourth the depth of the pot followed by the tree. Trim any crowded roots. Fill the pot with medium to about 2" from the pot rim, making sure any stem graft is above the soil level. Water thoroughly by filling the pot to the rim once a week, and let the planting surface dry between waterings. Snap off any twigs that grow from beneath the graft.

Citrus trees need good fertilizer. That is one of my two "secrets" to container-growing these trees. Different sources will give varying instructions on what to feed your potted trees. The most common is "fertilize with fruit tree food." While the plants will grow with an average fertilizer such as a 10-10-10 product, they don't seem to glow with good health under that diet. Citrus prefer a high-nitrogen diet, such as a 3-1-1 formulation. My first "secret" is simple—a bag of Bandini Citrus Food which I guard like a hoard of gold. This is a formulation of 12-8-4 fertilizer plus minor nutrients, and really does make a difference in the tree's growth and productivity. A 10-pound bag costs about \$7, and I still have half of my jealously-protected supply left. I fertilize on the first day of every month, giving larger trees three tablespoons of the dry pelleted fertilizer, and smaller ones a single tablespoon. I have never tried to grow them by "organic" methods, but if I were going to experiment, I'd used blood meal or fish meal for the nitrogen component, plus bone meal and potash as the basic formula.

It's not unusual for me to meet someone who has grown a citrus tree for many years that flowers beautifully, but bears no fruit. Sometimes, it will be a tree that was grown from a seed. My second "secret," which

answers this and ensures my citrus trees all produce fruit, is simple but often overlooked: cross-fertilization of the flowers. A single tree may be self-infertile, that is, unable to pollinate its own flowers. Others may be fully self-fertile, but rely on insects to carry the pollen from flower to flower. With two citrus trees, preferably of different varieties that flower at the same time, placed outdoors so bees can work on them, you can guarantee that good pollination has taken place. If the weather doesn't support pollinating insects when the flowers are blooming, you can be the pollinator. Just dust flowers gently with a soft craft paintbrush or cotton swab, first on one tree, then on the other. Your pollination rate and fruit formation will be even more assured if you have several different varieties of citrus trees.

Getting seed-grown trees to bear fruit may be an entirely different problem. It can take up to 15 years for a tree to become mature enough to fruit. Furthermore, even if the original seed came from a known variety (such as a Valencia orange), there is no guarantee that both of its parents were of the same type. It could be a first-generation hybrid of some kind. These trees can still be very attractive and produce fragrant flowers, but may never be able to give you fruit.

Insect pests are rarely a problem in backyard citrus grown outside of the main citrus-producing states (Florida, California, Arizona, and Texas). We've had occasional minor damage from munching grasshoppers, and the Key lime seems susceptible to a red-scale insect. Ants occasionally build nests in the pots during the summer months. Otherwise, the plants grow without interference from the usual troublemakers.

Tree sources

Citrus trees for home gardeners are much more common than they were two decades ago when I ordered my

little twig lemon from a seed catalog. Many seed catalogs now carry citrus in 4" pots for \$5 each or less, advertised in the "house plants" section. These are baby trees, and it will take them 3 years or longer to be able to begin fruit production.

Major department stores, including Wal-Mart and K-Mart carry citrus trees seasonally. Typically these run \$4 each in 4-6" pots. In the summer and autumn, our local Lowe's had several varieties of citrus (including satsuma, blood orange, kumquats, and lemons) in 8" pots for \$10 each.

There are on-line sources if you are anxious to begin growing these attractive and fragrant plants, located in the major citrus-producing states. Prices vary from \$16 per 1-gallon tree (plus \$8 shipping) to \$44 (plus \$15 shipping), depending on size and variety. Citrus cannot be shipped INTO Arizona, California, Florida, or Texas, even from other citrus-growing states, but can be shipped OUT of each of them.

Other websites can be accessed by keying "citrus trees" into your search engine. Both Florida and Texas agricultural agencies maintain extensive on-line information about growing citrus in their areas and are good sources for detailed data about these productive and pretty plants. Δ

Online nurseries

• **Garden of Delights, 14560 SW 14th St., Davie, FL 33325. Many varieties.** <http://www.gardenofdelights.com>

• **Four Winds Growers, California. No street-mail address on the website, but many nice citrus pictures.** <http://fourwindsgrowers.com>

• **James F. McCann, Inc, PO Box 561652, Orlando, FL 32856. Family operation.** <http://mccanninc.home.mindspring.com>



Companion planting

By Beverly Mettrot

Companion planting is nothing new, and yet in recent years it has made an extraordinary comeback, not only in fooling those pesky pests who thrive on fruits and vegetables in the vast majority of home gardens, but also in providing healthier, tastier foods.

The welter of odors, colors, and textures of heavily interplanted plant companions can confuse, deter, and even stop pests altogether. But plant companion methods can also confuse the home gardener in deciding which plants go where, with which other plants, and for what reason. Equally confusing are the ideal planting crops: why certain plants belong while others don't, which plants fool even the most

persistent of pests, and which ones are better left out of the garden.

There are virtually hundreds of examples of plant companions recorded in garden lore, and modern research substantiates their effectiveness. For instance strawberries, cabbage, and tomatoes can be planted in and around sage to benefit one another in the garden. But plant cucumbers with that same sage and you'll have a disaster on your hands.

While everyone loves the idea of seed turning to vegetable, things can (and do) go wrong during the growing season, namely pests. As Jack Kramer pointed out in *The Natural Way To Pest-Free Gardening*, "Insects are a highly trained, well-ordered society. So well ordered they can quickly destroy valuable plants in the garden."

That's where companion planting comes in. By intermixing certain aromatic herbs, or pungent French

marigolds, or any number of beneficial plants and flowers, the home gardener finds a natural deterrent which helps repel insects and better protects his crop.

The need for companion plants

I began experimenting with this method four years ago when I encountered my first tomato hornworm, and I'll be the first to attest that the combination of sweet basil and French marigolds really do keep these pesky little (or not so little) caterpillars at bay.

Much of today's companion planting is based on the combination of both fact and folklore, but scientists have enough evidence to convince them of the following:

- Plants with strong odors do confuse, deter, and oftentimes stop certain pests.

The interplanting of vegetables

The following table should act as a guide to help you eliminate certain problems in your garden.

Anise	Coriander	Aids the growth and flavor of Anise.
Asparagus	Parsley or basil	Controls Asparagus beetles.
Basil, Sweet	throughout garden	Enhances the flavor and growth of everything around it.
Carrots	Sage	Deters carrot (rust) flies.
Chamomile	throughout garden	Brings overall health to the garden. Attracts good insects.
Chervil	Radishes	One plant requires heavy nutrients while the other requires very little.
Chives	Carrots, grapes, roses, and tomatoes	Curb Japanese Beetles, and black spot.
Corn	Snap beans or soybeans	Enhances growth of corn.
Cosmos	throughout garden	Bad insects won't come near it, but it will attract pollinating wasps.
French Marigolds	throughout garden	Strong odor confuses pests looking for their favorite plant.
Garlic	throughout garden	Repels aphids and beetles.
Mustard	Beans	One plant requires heavy nutrients while the other requires very little.
Mints	Cabbage, strawberries	Deters aphids and other aphid pests, as well as ants who invade strawberries.
Nasturtiums	throughout garden	Repels aphids and white flies.
Onions	Carrots	The two combined help to control rust flies and some nematodes.
Peanuts	Corn	Increases yields of both crops.
Peas	Lettuce, spinach, and Chinese cabbage	Benefit from the shade and wind protection peas provide.
Potatoes	Horseradish and/or tansy	Plant plenty for maximum benefits in attempt to ward off Colorado Potato Beetles.
Radishes	Squash, cucumbers, and/or Carrots	Great deterrent against Cucumber Beetles and Rust flies. Also eliminates diseases spread by these plants.
Rue	throughout garden	Disagreeable taste and bad odor sends even persistent pests on their way.
Sage	Strawberries, Cabbage, and/or Tomatoes	Deters unwanted pests and benefits each other in garden.
Savory	throughout garden	Ideal planting crop. Attracts good insects.
Spinach	Beans or tomatoes	Benefits from the shade both plants provide.
Strawberries	Borage or sage	Enhances flavor of fruit and strengthens plant's resistance to insects and diseases.
Tansy	Cabbage and/or potatoes	Deters Cutworms, Cabbage Worms, and Colorado Potato Beetles.
Thyme	Tomatoes and/or cabbage	All three together control Flea Beetles, Cabbage Maggot, White Cabbage Butterflies, Colorado Potato Beetles, and imported Cabbage Worms.

- Certain plants hide other certain plants we don't want detected.

- Certain plants, and especially herbs, are considered nursery plants for the good insects providing shelter, nectar, pollen, and even dark, cool moist spots for lacewings, lady beetles, parasitic flies, and wasps.

- Certain plants serve as a "trap" crop, which pushes insects away from

other essential plants (rue's bad odor and disagreeable taste will keep even the most persistent of pests away).

- Certain plants create habitats which attract more beneficial insects (such as lady beetles, praying mantis, and ambush bugs).

Ideal planting crops are plants whose odors ward off unwanted insects. French marigolds are the best

example. Not only does its strong odor literally confuse pests looking for their favorite plants, but their roots give off a substance which repels nematodes. The more you have planted in the garden, the better its effectiveness.

Among the most popular of repellent plants are garlic and chives because of their powerful ability to repel aphids and beetles. Similarly, savory,



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chamomile, and thyme are ideal planting crops. These three herbs will attract more beneficial insects than any bright, pretty flower will. So when you're planning your summer garden, include plenty of each.

Virtually all herbs benefit the garden in some way, whether to attract good insects, enhance the flavor of nearby plants, or to confuse those insects we simply don't want around.

Certain flowers also attract beneficial insects: asters, zinnia, and sunflowers all work together to keep the good company coming to our yards. When I put in our sidewalk, I wanted plenty of flowers to line it. Many of

the plants I included led me to my first encounters with lacewings and ambush bugs. Thank goodness I looked them up before plucking them off.

The don'ts

Sometimes, the toxins of one plant totally destroy the health or growth of certain other plants. A Black Walnut tree, planted within 60 feet of your garden, can inhibit the growth and/or development of vegetables, azaleas, rhododendrons, blackberries, lilacs, peonies, and apple trees. It gives off a toxin called juglone which can do some serious damage to other plants.

THE DON'TS OF COMPANION PLANTING

- Don't plant French marigolds with beans.
- Don't plant tansy with collards.
- Don't plant cucumbers with sage.
- Don't plant chrysanthemums with lettuce.
- Don't plant wormwood with peas or beans (wormwood in other areas of the garden will deter slugs.)
- Don't plant peppers with tomatoes, potatoes, eggplant, or where peppers were planted in the last three years.
- Don't plant tomatoes with fennel or potatoes.
- Don't plant families that are closely related, and attract the same pests.
- Don't plant allelopathic plants too close to your garden.

This chemical reaction is known as allelopathy. Sunflowers also have allelopathic properties.

If you see a plant failing, but can't see any visible reason why, it might be its neighbor. (See "The don'ts of companion planting.") Δ

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the gee-whiz! page

By O.E. MacDougal

The Confederados

In the late 1860s, right after the War Between the States, some Southerners, dissatisfied with the outcome of the War and fearful of Union reprisals, migrated to Brazil. No one knows for sure how many left, but estimates run from 9,000 to 40,000. Whatever the numbers, it is the largest emigration from the United States in our history.

Why Brazil? Dom Pedro II, then Emperor of Brazil, was a supporter of the Confederacy. But more importantly, he realized that Brazil needed the agrarian, textile and educational expertise Southern planters could bring with them. He placed ads for immigrants all over the South and as far north as Baltimore and New York City.

For the Southerners who took the offer, it was a chance to build a new life for themselves and to preserve important elements of their Old South heritage. They came from every state in the South, though most were from Alabama and Texas.

At the time, slavery was still legal in Brazil and this has led to speculation that the Confederados went there in a futile attempt to perpetuate it. But the slave system in Brazil was in decline and was peacefully abolished in 1888. And, as it turned out, almost none of the Confederados engaged in slavery once they settled in their new country.

The most important of the American "colonies" founded was Vila Americana (American Town) in southeastern Brazil. It was founded by William Hutchinson Norris, a retired colonel born in Georgia who later became a lawyer in Alabama.

While most immigrants from other countries were quickly absorbed by the surrounding culture, the Confederados, though they numbered but a few thousand and appeared earlier than most of the other groups, retained distinctive traits of the Confederate South they left behind. And after 135 years, many of their descendants still speak English-English with a southern accent-as a first language.

Four times a year, under fluttering Confederate flags, women and girls in hoop skirts and men and boys wearing rebel gray dance reels, eat fried chicken and other southern dishes, and sing Dixie-in Portuguese. They are members of the Fraternidade Descendencia Americana, founded in 1954 to preserve ties to U.S. culture among the 100,000 to 150,000 heirs of the original emigrants.

Within a few generations of arriving in Brazil, Confederados were intermarrying with Germans, Italians, Arabs, Indians, and, of all people, blacks, so that today many of the "southern belles" and "rebel" soldiers dancing and singing Dixie would, if they were still in America, be considered mulatto or black.

This creates an irony in that the Confederacy and its flag, now symbols of racism to many in the United States, are devoid of that meaning among today's Confederados, many of whom are part black.

Also, many of the descendants of the Confederados-both men and women-have "Lee," as in Robert E. Lee, as part of their names. And Vila Americana (pop. 200,000) is the only city in Brazil that has had a coat of arms that includes a Confederate flag as its centerpiece.

Dom Pedro's gamble of attracting these immigrants from the American South has paid off. Among the contributions the Confederados brought to the parts of Brazil they settled were the plow, spade, harrow, and rake, and other tools virtually unknown to many Brazilian peasants of the time. But the Brazilians were quick to see the advantages of these tools and, just as quickly, adopted them. The Confederados also built their houses as they built them in the South, with chimneys, gutters, and window sashes. To their fellow Brazilians these became known as English houses.

Today, Vila Americana has the highest per capita income and educational levels of any city in Brazil, in part because the Confederados set up schools which are still among the best in Brazil. They also stressed education, started businesses, and many of the railroads and public works that now exist in that country were built by companies owned or run by the Confederados.

Postage stamps

There was a time when a person mailing a letter in the United States had the choice of either paying the postage or having it paid by the person receiving the letter. However, when letters were refused or undeliverable the loss had to be absorbed by the Post Office.

It was to stem these losses that, in 1847, postal laws were changed and it was decreed that, henceforth, the sender *had* to pay the postage. Evidence of this was a stamp that was affixed to the letter. Thus the birth of American postage stamps.

CHAPTER 3:

OCCUPATIONAL HAZARD

By Robert Waters

This is the second installment of Robert A. Waters' *Guns Save Lives*. The first installment appeared in the March/April 2003 issue of *BHM*. Future issues of *BHM* will contain some other chapters of Waters' book.

"It was a dreadful thing I had to do. Human life is precious to me. I hated to do it, but there was no other choice." Ann Barry, May 14, 1997

The twenty-year-old Ford Grenada was sagging. In addition to the woman at the wheel and two men crowded into the front seat, the rear was loaded with loot from earlier burglaries. VCRs, bags filled with jewelry, guns, and household items. Anything that could be easily sold for drugs.

It was Monday, May 12, 1997. This was to be just another heist for Tonya Marie Guntle, 26, James Shugart, 28, and Gordon W. Childress, 18.

They drove along Plum Springs Road, three miles north of Bowling Green, Kentucky. Bright-beam headlights guided the way. Guntle stayed well below the speed limit. She didn't need a state trooper pulling her over for some minor traffic violation.

"There it is," Childress said, pointing to a house in the distance. He'd scouted the area earlier. It was a ranch-style home with an enclosed garage. The house sat on a hill in the darkness, looking deserted.

A perfect target, Guntle thought. The only other house in sight had a "For Sale" sign out front and was obviously vacant. The mother of four had learned a lot since teaming up with Jimmy.

Guntle cut the lights, then glided into the driveway.

"Keep it running," Shugart ordered. "And keep your foot off the brake!"

Her face reddened, and she was glad the men couldn't see. They'd almost been caught a few weeks earlier when Guntle had rested her foot on the brake during a burglary. Someone had seen the brake lights and called the cops. Fortunately, they were able to escape by using the backroads, but Shugart hadn't been happy.

*Oh God, she thought,
they're in the kitchen and
headed toward my
bedroom.*

He handed her a walkie-talkie. "Anybody comes down this road, let us know," he commanded.

Guntle nodded, then watched as the two men disappeared into the shadows.

Sweat beaded her lips. They'd been knocking over houses for months now, and she kept thinking she'd get

used to the knot in her gut. Jimmy had told her that nervous fear keeps you on your toes. Maybe, but she didn't like it.

Suddenly the walkie-talkie belched. Guntle jerked and her body became rigid. "We're in the garage," Jimmy said. "Now we gotta get in the house." He paused, then said, "They got it locked up tighter'n a drum!"

Then it was quiet again.

Guntle sat listening to the motor run. It had a loose rod, and the click-click-click was driving her insane.

The walkie-talkie sounded again. A series of heavy thuds almost knocked it out of her hand.

Jesus, she asked herself, what the hell are they doing?

After what seemed like an hour of hammering, Jimmy whispered into the radio. "We're in the house!" he breathed. "Had to ax down the door."

Guntle sighed in relief. She glanced at her watch. It was exactly 11 p.m.

In a recent interview, Ann Barry, a professor at Western Kentucky University, recalled that evening.

"I had just turned in my final grades," she remembered, "ending the spring semester, and felt as though I was suffering from battle fatigue. I went to bed at 9:30 and fell into a deep sleep."

Later, she heard a thump. Somewhere in her consciousness she thought she was having a nightmare. She turned over in her bed and drifted back to sleep.

A loud bang awakened her. She sat up in bed, her heart pounding. What's going on? she wondered.

The racket sounded like it came from outside, as if someone were chopping up a tree. Barry was wide awake now. She heard a splintering sound. It was then she realized that someone was battering down her door.

She later recalled, "You talk about a few minutes of sheer terror. My heart was frozen. I'm just grateful to God I could function."

Barry's first thought was to dial 911. But before she could grab her telephone she heard whispered voices inside her home.

Her heart pumped. Oh God, she thought, they're in the kitchen and headed toward my bedroom.

Her grandfather had taught her to shoot a rifle when she was eight-years-old. She'd hunted with him when she was a child, but it was only recently that she'd purchased a handgun. In October, 1996, the Kentucky Concealed Weapons Permit law went into effect. Although the law was opposed by such organizations as the Kentucky Association of Chiefs of Police, Barry had been active in lobbying her friends and associates to push for passage of the bill.

As a 60-year-old single woman whose duties included teaching night courses, she felt the need for self-protection. Within weeks of the passage of the Concealed Permit law, Barry took the required course and received her license to carry a firearm.

"It's not something I did on a lark," she explained. "I take the responsibility very seriously."

Now Barry remembered the training she'd received. Remain calm, the instructors had drilled into her. Look for a way out.

If there is one, run like hell to get away. Deadly force is to be used only as a last resort.

If there's no other way, don't panic. But if you *must* shoot, shoot to kill.

"I thought, they're breaking down the door," Barry recalled. "They're coming to get me. I've only got a few seconds to think about what I'm going to have to do. I wanted to run, but there was no way out. I was trapped."

Barry kept a Ruger SP-101 .357 Magnum on her nightstand. The stainless steel 5-shot revolver was loaded with Hy-Shok cartridges, the same type used by many law enforcement officers in Bowling Green. These hollow-point bullets were designed to quickly stop a violent assailant.

*Now she saw the gunman.
He held a pistol in his
right hand.*

She heard footsteps moving closer. Her heart was thumping so loudly that she thought the intruder could surely hear it.

Grabbing her gun, she cocked it and inched toward the hallway. Joe Brewer and Debbie Williams, her shooting instructors, had prepared Barry for just such a situation. Stay in the shadows, they had emphasized. Be silent, and let the invader come to you.

Now she saw the gunman. He held a pistol in his right hand.

Was this the only intruder? she wondered.

"I had to seek a position to defend myself from whoever was coming toward my bedroom," Barry recalled. "Who? How many? My mind was frozen. I couldn't breathe. All I could do was take short, quick gasps....like a dog panting in the summer."

She watched the shadow move closer, then peer into the bedroom opposite hers.

The light snapped on, and she jumped.

Oh, God! Please help me, she prayed. The gunman was no more than three feet away. He glanced into the bedroom, then started to turn toward her.

It's now or never, Barry realized. If she didn't shoot now, the man would kill her. She stepped out of the doorway in order to position herself for the shot. Then she pointed the barrel toward his body and quickly pressed the trigger. The flash blinded her momentarily, and the percussion shook the little room. Suddenly, the hallway was filled with smoke.

The gunman shouted something unintelligible and reeled back against the opposite wall.

Barry jumped back into the darkness of her bedroom. It was just in the nick of time. "As soon as the bullet hit him," Barry said, "he swung around and started spraying bullets at me." Yellow flames rocketed from the barrel of his gun. Explosions deafened her. Bullets thudded into the walls within a few feet of her.

How could he miss? Barry wondered. He was less than five feet away.

She raised her gun to fire again, but the gunman abruptly turned and started back down the hall. Then he began to stagger, and she heard him crashing into furniture as he fled through the kitchen and back out into the garage.

She said, "I waited for what seemed like forever, until I felt sure that he was out of my house, and not lurking in the darkness waiting for me to emerge. Inching my way up the hall and finally peering from the kitchen door out through the garage windows, I could see lights on a vehicle where my driveway meets the road."

Barry picked up the telephone in the kitchen. Her hands were shaking so badly she could barely hold it. Her fingers punched at the numbers. After three tries, she finally managed to hit 911.

Outside, a scene was playing itself out that might have been comical in some other context.

Tonya Marie Guntle had heard several muffled pops inside the house, then watched Childress burst from the garage and sprint toward the car. He swung open the passenger door and dropped onto the seat.

"What the hell happened?" she asked.

Childress opened his mouth but no words came out.

"Where's Jimmy?"

As if in answer to her question, Shugart stumbled out of the garage. His legs wobbled, and he suddenly fell. Convulsing, as if he was having a seizure, he began to crawl toward the station wagon.

"Go help him!" Guntle ordered Childress. Childress hesitated, then jumped out of the car and ran back across the lawn. He pulled the wounded man to his feet and dragged him to the car. After pushing Shugart into the back seat, Childress climbed in beside Guntle.

"Let's get outta here!" he screamed. His eyes were wide as he yelled, "Hit it!"

Guntle pulled the stick shift down, and the car suddenly rocketed backward.

"Take your foot off the gas!" Childress shouted. But it was too late. The car slammed to a stop in a ditch.

Shugart moaned. Guntle glanced into the back seat. She gagged when she saw a fist-sized hole in his side and blood pouring out of the wound onto the seat.

Guntle was terrified. She shifted into first and punched the accelerator to the floor. The tires spun but the car wouldn't budge. The ditch was too deep. She clawed at the gear shift, but the damned thing still wouldn't move. Tires whined, and it rocked from side to side.

Guntle couldn't breathe. She had to get out of that closed car. She pushed open the door, stumbled out into the

darkness, and fled down the road. When she looked back, Guntle saw blue lights flashing in the distance.

After calling 911, Barry dialed her mother, Selma Guthrie, who lived nearby. While speaking on the phone, she could see the lights of the car outside. Barry knew that the station wagon was stuck in the drainage ditch beside her driveway, and that only a wrecker would be able to pull it out.

"...he swung around and started spraying bullets at me." Yellow flames rocketed from the barrel of his gun. Explosions deafened her. Bullets thudded into the walls within a few feet of her.

She heard the approaching sirens, and suddenly her driveway was filled with Kentucky State Police cruisers. Before the officers entered the house, she went from room to room, turning on every light in the house. Then she turned on the floodlights outside.

As an investigator took her statement, others began a meticulous search of the house. In a closet next to Barry's bedroom, they found her clothes riddled with bullet holes. Technicians dusted the entire house for fingerprints.

Amazingly, there was no blood inside the house. But on a patio door leading into the garage, officers located a shoeprint, later found to match one of Childress' shoes.

As Barry gave her statement, Kentucky State Police initiated a search of the grounds and surrounding area. The troopers had found massive amounts of blood in the old

sedan. They concluded that the gunman couldn't get far.

Meanwhile, detectives traced the license plate. They found that the car belonged to Tonya Marie Guntle, of Bowling Green. They also determined that at least two men had broken into the house.

After forcing entry into the garage, the intruders had encountered a sturdy kitchen door with three locks. Unable to kick it in, they'd found a pick-ax in the garage and used it to smash through the door. They'd begun to loot Barry's house—they had gone so far as to place a teakwood jewelry box on her car.

Outside, as the troopers prowled the area with spotlights, they heard a voice calling from a field across the road. Someone was yelling for help. A state trooper moved cautiously toward the suspect. Lying on his stomach in the grass, he identified himself as James Shugart.

"Can't breathe," he gasped. "I need oxygen." Shugart lay in a pool of blood, his eyes fluttering in their sockets. "Some woman shot me," he said. "Oh God, I think I'm gonna die."

"Son," the trooper retorted as he snapped handcuffs on the wounded man, "in your line of work, it's called an occupational hazard."

Shugart's arrest record was extensive. He was known to local police as a professional burglar and drug addict. He was transported to a local hospital, where surgery saved his life. However, the bullet had blasted through his colon, causing permanent damage.

Guntle, Shugart's girlfriend, was quickly arrested. As was her custom, she had left her four young children home alone while she drove the getaway car.

A few days later, Childress was arrested. Each suspect was charged with attempted murder and armed burglary. They were ultimately con-

victed and sentenced to long prison terms.

In a recent interview, KSP Investigator Stan Harlow stated that he attempted to obtain a statement from Shugart while he was in the hospital recuperating from the gunshot wound. Although Shugart refused to speak with the detective about the bungled burglary, he wanted to talk about Ann Barry.

"That woman," he said, "was just looking to shoot someone." As if it was the victim's fault, Harlow thought.

In a recent interview, Barry stated that the police treated her with the utmost respect. "My brother, Jim Guthrie, and his wife, Georgia, came to be with me that night," she remembers. "The troopers were talking with Jim about his experiences in Vietnam, and one said, 'Hey, Jim, you should have had your sister with you when you were in Nam.' Jim replied, 'I sure could have used her.' Of course, they

were just trying to make me feel calm and secure."

"We're living in violent times, and it is getting worse," Barry continued. "Littleton is one example. With population and economic pressures, along with the perennial threat of nuclear warfare, I cannot visualize any measures society can take to thwart the actions of mentally deranged minds, young or old."

Ann Barry received massive support from the community, and got national attention for her successful defense of her life. In addition to having her story heralded by national commentator Paul Harvey, she acted in a reenactment for an Arts & Entertainment television special entitled, *Guns Under Fire*. Other radio and television interviews followed.

Barry spoke of her feelings on gun control. "I have no problem with raising the age of gun sales to 21," she said, "although young men and women fight our wars at 18. Many of

these young people are angry that they can't privately own a handgun."

She continued, "Having sellers at gunshows to require background checks is okay. Safety locks are a good idea if you have children, but keep at least one gun hidden away—loaded and ready to use in case of an emergency. It should be well-located, and in a place only the owner knows about, so you don't have to run all over the place to get to it.

"One suggestion has been to require combination safety locks. That's crazy! The gun is in the dark, unloaded, and you're trying to work a combination lock, load the gun, and be ready to protect your family from a home invasion, all within a matter of seconds. Forget it—you're dead, murdered by criminals who follow *no legal restrictions!*"

Barry cringed at the thought of what would have happened to her had she been required by law to have her gun secured with a safety lock. She knows she would be dead. Δ

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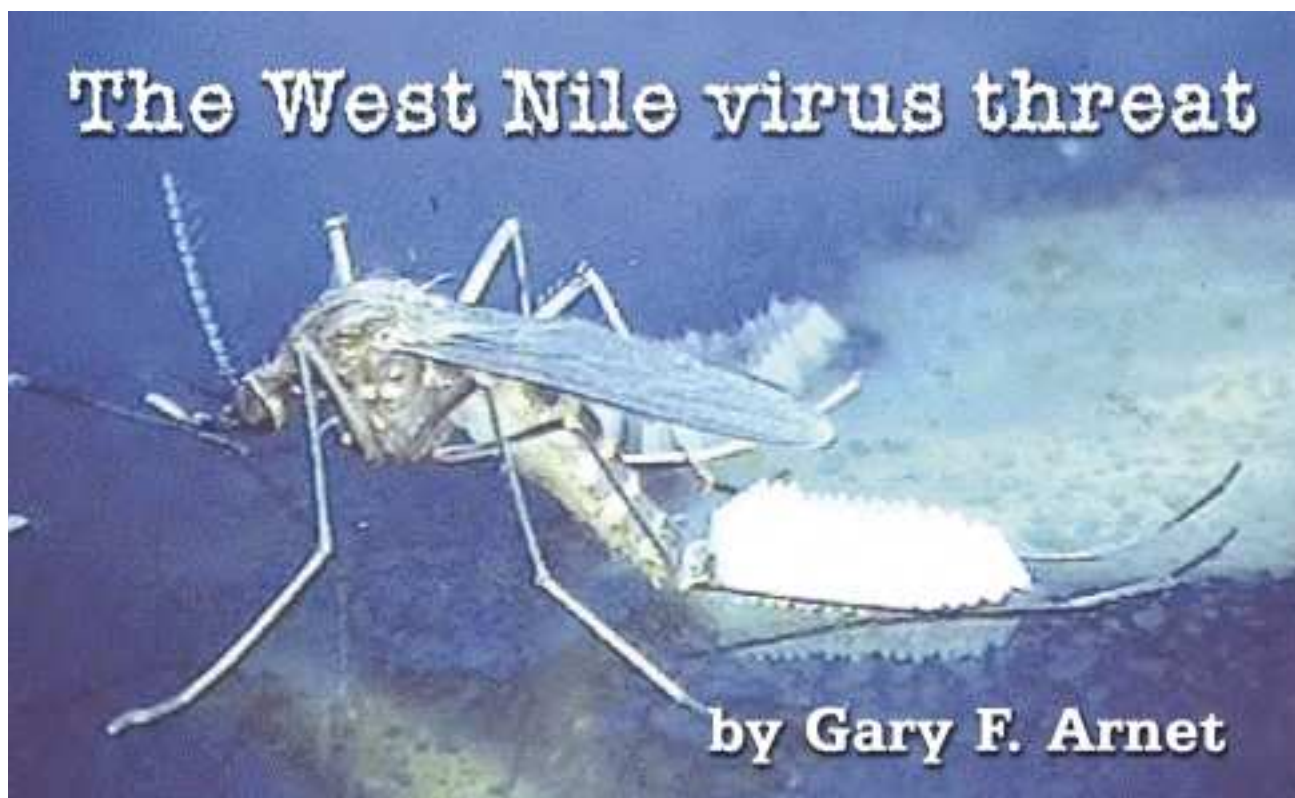
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West Nile virus is spread between animals and humans by mosquitoes. The female of the Culex species, shown here laying eggs on water, is the most common mosquito to carry the virus in the United States. (Photograph courtesy of U.S. Centers for Disease Control.)

The largest reported outbreak of West Nile virus encephalitis in the history of the world occurred in the United States last year. Authorities are wondering if this year will be as bad or worse.

West Nile virus causes disease in humans, birds, horses, and some other mammals. Previously only found in Africa, West Asia, and the Middle East, it spread to temperate areas of the United States and Europe in recent years. In humans, it causes a disease that can range from mild to severe flu-like symptoms, called West Nile fever, to severe or fatal inflammations of the brain, called West Nile encephalitis.

It is estimated that West Nile fever will develop in about 20 percent of people who are infected with West Nile virus. Symptoms can include

fever, body ache, headache, swollen lymph nodes, and, sometimes, a skin rash on the trunk of the body.

About 1 in 150 people infected with the virus will develop the more severe West Nile encephalitis or meningitis. Symptoms include high fever, stiff neck, disorientation, muscle weakness, convulsions, paralysis, and coma. About 10% of people who develop encephalitis die, while many other are left with permanent brain damage.

The first reported case of West Nile virus was in a woman in Uganda in 1937. Outbreaks of human disease occurred in Israel and Egypt in the 1950s and tens of thousands of South Africans became sick in 1974. The equine form of West Nile virus was noted in horses in France and Egypt in the 1960s.

Early in the summer of 1999, this virus was first found in the eastern United States. It is not known when it first arrived or from where it originated, although it is genetically related to strains found in the Middle East. In August 1999, the first outbreak killed a number of birds at the zoo in the Bronx, New York City. Later in the year dozens of people in New York City became sick and seven people died.

Since first infecting humans in New York, West Nile virus has spread throughout the United States within three years. Reaching the West Coast last summer, it is now permanently established in the Western Hemisphere. Human cases of West Nile virus have spread to 39 states and the District of Columbia, with 3949 cases and 254 deaths occurring in 2002. All residents of geographic



*Map showing how West Nile virus has spread throughout the United States since its first occurrence in New York in 1999.
(Map courtesy of U.S. Centers for Disease Control.)*

areas where the virus is present are at risk of the disease, with the fatal encephalitis most often affecting those over 50-years-old. It can be expected that the disease will continue its spread westward in 2003, affecting the populous areas of the entire West coast by the spring or summer.

Authorities are not sure why the virus has affected so many people in the United States so quickly. It may be that since this virus is new to this part of the world people and animals have not been exposed to it previously and have not developed immunity to the virus. The large elderly population found in the United States is also more susceptible to the disease.

In Africa, West Nile virus is so common that most children probably get mild cases, giving them immunity for life. An outbreak in South Africa in 1974 caused West Nile fever in tens of thousands of people, although only one case of West Nile encephalitis was reported. The large numbers of cases of encephalitis is what makes the recent outbreak in the United States different.

West Nile virus is a flavivirus, a type of virus that lives in vertebrates

(animals with a backbone), which is transmitted from animal to animal by blood-feeding insects, such as mosquitoes, "no-see-ums," ticks, and sand flies. Other flaviviruses include yellow fever, dengue fever, and St. Louis encephalitis.

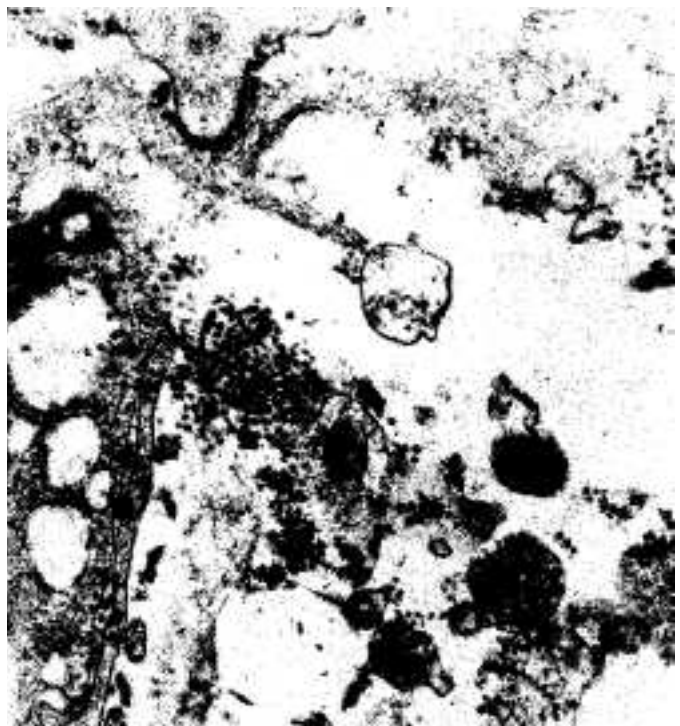
Mosquitoes are the only insects that transmit West Nile virus in the United States. Although members of the *Culex* species are the most frequent carriers, it has been found in 36 of the 200 different species of mosquitoes in the country. Mosquitoes pick up the virus by feeding on birds and other animals that are infected and then they trans-

mit the virus to humans when they feed on them.

Not all mosquitoes in an area infected with West Nile virus will be infected and not all humans exposed to infected mosquitoes will get the disease. The chance is low that a person will become ill from a mosquito bite, however, when they do, it typically occurs 3 to 14 days after being bitten. Most people who become infected with the disease develop antibodies within 7 to 14 days clearing the virus from the body and giving them immunity from re-infection.

Female mosquitoes have a long skin-piercing proboscis that is used to pierce the skin of animals, while males do not. Nectar from flowers is the principal food for both male and female mosquitoes, although female mosquitoes also bite an animal or human in order to feed on blood.

This blood meal gives them the protein they need to produce several hundred eggs every few days. Eggs are usually laid at night on the surface of



Electron microscopic view of West Nile virus in the brain tissue of a crow found in New York. The dark spots within the tissue are virus organisms. Photograph is from U.S. Centers for Disease Control.



When outdoors in mosquito areas, protect yourself by wearing long pants, long-sleeved shirts, and by wearing enclosed shoes or boots. Insect repellents can be used on skin or clothing to repel mosquitoes.

stagnant water in groups of eggs called rafts. Each raft, containing 100 to 300 eggs, is about ¼ inch long and ⅛ inch wide and appears like soot floating on the water surface. Eggs hatch into a larvae within 24 to 48 hours, which live in water and feed while developing into the third stage, pupae. Pupae live in water also, but do not feed as they develop into adults.

An adult female may lay a raft of eggs every three nights during her life and bites another animal host before laying more eggs. *Culex* species of mosquitoes live for only a few weeks in the summer months.

Mosquitoes are not active in most parts of the country during the winter, but adults survive through the winter and become reproductively active during spring as the snow melts. Mosquito season in most areas is May through October. In temperate climates West Nile encephalitis

occurs primarily in the late summer, although in southern climates the virus can be transmitted year round.

Mosquitoes are attracted to an animal host by a combination of carbon dioxide, temperature, moisture, smell, color, and movement. Horses, cattle, small mammals, and birds are the preferred host by mosquitoes, although they certainly feed on humans.

Female mosquitoes carry the virus in their salivary glands and spread the virus as they feed on the blood of vertebrate animals. Birds are a main cause of infection in humans and horses. Infected birds develop large amounts of circulating virus in their bloodstream that is transmitted when they are bit by other mosquitoes. Humans, horses, and other mammals do not produce large amounts of the virus in their bloodstream, so if a mosquito bites them it cannot become infected and spread the disease to another human or animal.

At least 138 species of birds have been infected with West Nile virus, especially crows and jays. Most infected birds become ill, but survive, although some die. West Nile virus primarily circulates back and forth between infected birds and mosquitoes. Handling of infected live or dead birds has not been shown to transmit the disease to humans.

Horses can become infected with equine West Nile virus from the bite of infected mosquitoes and about 40 percent of the time the disease is fatal. When possible, a horse should be protected from mosquito bites if it is in a region containing West Nile virus. A vaccine, West Nile virus vaccine, was recently licensed for horses to prevent encephalitis and is generally recommended by veterinarians. Its effectiveness is unknown, however. There is no vaccine for humans. Horses vaccinated against other types of encephalitis, including eastern equine encephalitis, western equine encephalitis, and Venezuelan equine



Insect repellents vary in the concentration of DEET. The Muskol Insect Repellent Lotion shown here is 95% DEET, while the Repel Insect Block is 19%. Repellents used on the skin should be no greater than 15% DEET for children and 35% DEET for adults.

Aerosol Cutter Insect Repellent (not shown) contains 9.5% DEET and would be good to use with children.

encephalitis, are not protected against West Nile encephalitis.

West Nile virus does not seem to cause severe illness in cats and dogs even though they may be infected. A study in New York City in 1999 showed the virus was frequently present in the blood of dogs, although there have been no documented cases of dogs contracting the disease.



Hats with mosquito netting can be used to cover the head and neck when it is necessary to work or travel through areas heavily infested with mosquitoes.

While theoretically possible, there have been no documented cases of dogs or cats becoming infected by eating infected birds. The Centers for Disease Control have received a small number of reports of West Nile virus infections in other mammals, including bats, a chipmunk, a squirrel, a skunk, and a domestic rabbit.

Until recently, it was thought that mosquitoes were the only way that West Nile virus could be transmitted

the virus on to her child through breast-feeding. The child is not thought to have ever come in contact with mosquitoes.

Four recipients of organs from one infected organ donor contracted West Nile virus, documenting that the disease may be spread in this manner. The Centers for Disease Control are investigating other reports of disease transmission from organ transplants and blood transfusions. Hospitals and

blood banks are taking more precautions now that they are aware that the virus may be transmitted in this way. Blood transfusions and organ transplants are needed to save lives, and, while there is a slight risk of West Nile virus, the benefits certainly outweigh the risks.

While possible, the risk of getting West Nile virus from pregnancy, breast-feeding, blood transfusions, or organ transplants appears rare. Mosquitoes are by far

the most likely means of transmission.

Personal protection

Since transmission in the United States is primarily from mosquitoes, prevention is aimed at protecting yourself, your family, and your employees from mosquito bites and by decreasing mosquito habitat. The National Institute for Occupational Safety and Health states outdoor workers at the highest risk of exposure to the virus include farmers, foresters, landscapers, groundskeepers, painters, roofers, pavers, construction workers, and other outdoor workers. Individuals living in or traveling through an infected area are also at risk.

Obviously, the way to avoid bites is to avoid mosquito habitat as much as possible in the times they are feeding. While mosquitoes often bite most actively at dusk and dawn, some are active throughout the day. This is especially so in shaded, wooded, brushy, or weeded areas.

Staying indoors and avoiding work or activity in these areas when mosquitoes are most active is a way to avoid bites. As this is not always possible, individuals should wear long-sleeved shirts, long pants, gloves, and socks in these situations. Hats with mosquito nets that cover the head and neck are also useful when it is necessary to enter areas of very high mosquito concentrations. Cover infant carriers with mosquito netting when taking infants outdoors. Install or repair screens (16 to 18 mesh) over windows or doors to help prevent mosquitoes from getting indoors.

Insect repellents will also stop mosquito bites. Repellents are chemicals in the form of sprays, liquids, creams, lotions, sticks, or towelettes that are applied to the skin or clothes.

The active ingredient in the most effective and most common repellents is DEET, N-N-diethyl-meta-tolu-amine. Various commercial products have different formulas and concentrations of DEET. Products may be used on clothes or skin in concentrations no greater than 10 to 15 percent on children and no greater than 30 to 35 percent on adults. It should not be used on infants. Use just enough to cover exposed skin or clothes, but do not apply to skin that is covered by clothing. Do not apply to the eyes or mouth and do not apply repellent to the hands of young children who may rub their eyes or place their hands in their mouth. DEET may be applied every four to eight hours and should be washed off the skin when coming inside.

Repellents containing the chemical Permethrin are also effective, but are for use on clothes only. Do not apply



Horses can become infected with equine West Nile virus from the bite of infected mosquitoes and about 40% of the time the disease is fatal. A vaccine is now available and is recommended by veterinarians for horses in regions with West Nile virus.

from person to person. Recent reports have shown that it can also be transmitted other ways, however.

A 20-year old mother in New York City was hospitalized with West Nile fever in September 2002. In November, she gave birth to a daughter who was tested and found to have West Nile virus. The infant has central nervous system problems, possibly caused by the virus. Although six other pregnant women have been documented to have West Nile virus, this is the first documented case of prenatal transmission of the disease.

One case of transmission through breast-feeding has been reported in Michigan. A woman contracted West Nile virus from a blood transfusion shortly after giving birth and passed

For additional information about West Nile virus

U.S. Centers for Disease Control:
www.cdc.gov/ncicoc/dvbid/westnile/index.htm

U.S. Food and Drug Administration:
www.fda.gov/oc/opacom/hottopics/westnile.html

U.S. Environmental Protection Agency:
www.epa.gov/pesticides/factsheets/skeeters.htm

American Mosquito Control Association:
www.mosquito.org

Mosquito Magnet Mosquito Trap: www.mosquitomagnet.com

them to the skin. They should be applied to the outside of clothing before putting them on and allowed to dry outdoors for at least four hours before wearing. The clothes should not be treated more than once every two weeks.

Citronella is a natural extract from a lemon-scented grass and gives moderate protection from mosquitoes. Repellent products that have citronella as the active ingredient are available. Some people have found that Avon Skin-So-Soft bath oil works as a repellent. Tests have shown that protection may only last 10 to 20 minutes, however.

Read the labels of any insect repellent carefully and follow the manufacturer's recommendations. Repellents may be absorbed through the skin and, very rarely, serious reactions may occur. Some people may have skin irritations or allergic reactions to DEET. When used improperly with children, DEET products may cause slurred speech, confusion, seizures, and even coma.

Oil of citronella, found in candles, torches, or coils, may be burned outdoors to produce smoke that repels mosquitoes. It works for a small area in windless conditions, but is not as effective as repellents applied to the skin.

Mosquito control

Decreasing the mosquito population by reducing reproduction is another way to prevent mosquito bites. This can be accomplished by finding and eliminating breeding sites, using insecticides, or by mosquito traps.

Eliminate sources of stagnant water to eliminate breeding sites. Covering, removing, or turning over equipment, buckets, wheelbarrows, and cans that hold water is a start. Discard old tires, cans, and trash that can

hold standing water. Clean out rain gutters and ditches. Check for standing water in tarps over piles of wood, stored boats, and other such areas. Once or twice a week, empty water from sources around your house such as birdbaths, pet water dishes, flower pots, swimming pool covers, buckets and barrels. Be sure to check for containers in hard to see areas, such as under plants around your house.

Adult mosquitoes rest on plants and weeds. Homeowners can decrease mosquitoes around their house by cutting weeds, trimming plants, and mowing the lawn regularly.

Insecticides may be used to kill mosquitoes. Inside a house, household aerosol sprays containing pyrethrum are effective to rapidly kill mosquitoes, but do not manage them for long periods of time. They do not work outdoors where the spray disperses rapidly.

Hand-held ULV foggers may be used outdoors by homeowners, businesses, or farmers. Living in a heavy mosquito area, I have found spray cans of fogger available at local garden and hardware stores to be very effective in helping to control mosquito populations. Spray plants, trees, lawns, and other moist areas of your yard, paying particular attention to shaded areas. Attachments for appli-



Hand-held ULV foggers, such as Raid Yard Guard, shown here, may be used outdoors by homeowners, businesses, or farmers to control mosquitoes around homes and buildings. Spray plants, trees, lawns, and other moist areas of a yard.

cation of sprays by tractor or lawn mower are also available. Malathion five-percent and pyrethrins can be used for outdoor fogging.

Local mosquito abatement programs can provide mosquito fish (*Gambusia*) that eat mosquito larvae. These can be placed in ponds, animal watering troughs, and other areas of water that are needed in agricultural or animal operations and cannot be drained. Larvicides, such as "Mosquito Dunks" and "Mosquito Bits" may be used to treat ornamental pools. You can obtain more information from your state or county mosquito abatement program or the American Mosquito Control Association (www.mosquito.org).

Recently, new products for homeowner or business use have been marketed to reduce mosquito populations. Called mosquito traps, they are

designed to attract and trap or kill mosquitoes. They are a self-contained unit powered by propane or electricity that lure female mosquitoes by emitting carbon dioxide to simulate an animal host. Once in the trap they are either drawn into a net where they dehydrate and die, adhere to a sticky surface, or are electrocuted. Mosquito traps will not prevent you from being bitten by mosquitoes. They simply attract mosquitoes away from you and reduce the number of mosquitoes that are around.

These products have an advantage of being able to be placed a distance from a house, allowing mosquitoes to be intercepted before they come near the areas of human activity. Mosquito Magnet is one popular brand on the market. Interestingly, studies have shown that different brands attract different types of mosquitoes.

Homeowners I spoke with who live in a heavy mosquito area in Florida said they had a significant reduction of mosquitoes after using mosquito traps. There is no question that mosquito traps do trap and kill large numbers of mosquitoes. Whether or not they will noticeably reduce mosquito populations in your area depend on many factors, including the size and proximity of the mosquito population, species of mosquito, breeding habitat, and wind direction and velocity.

Birds, bats, dragonflies, and frogs have been used in an attempt to control mosquitoes via biological methods. There is no evidence that they consume enough mosquitoes to make a difference in mosquito populations.

Local health departments throughout the United States have surveillance programs to monitor and warn the public about West Nile virus in mosquitoes, birds, horses, other animals, and humans in their areas. Many areas have established programs for mosquito control and spraying.

Where is this going?

It is likely that 2003 will be another year of West Nile virus infections in humans as the disease spreads across the West Coast. At some point after that, the disease will, hopefully, lessen as more people are exposed to the virus and develop immunity to the disease.

Currently, there are no human vaccines and no drugs available to treat West Nile virus, however, there is extensive research to find some. Researchers began looking for a vaccine as soon as the disease appeared in New York and the National Academy of Sciences reported that a vaccine developed in 2002 is being tested. Research in antiviral drugs that may be effective in treating the disease is also ongoing.

Individuals who have the symptoms of West Nile fever, including fever, severe headaches, confusion, or muscle weakness, should see their physician immediately. The disease should

be considered in individuals with unexplained encephalitis who live or have traveled in infected regions. Blood samples can be taken to confirm the disease.


There is no specific treatment at this time. Supportive care to treat fever, pain, and avoid dehydration while the body fights the infection is available. In severe cases, hospitalization with intravenous fluids, respiratory support, and prevention of secondary infections is necessary.

Shortly, as mosquito season hits the country and more people are infected, West Nile virus will again become a nightly news topic. There is no need for panic, as the chances of an individual contracting West Nile fever or encephalitis are low. The consequences of contracting the disease is so severe, however, that it makes sense to take the simple precautions to prevent mosquito bites and to do what you can to decrease mosquito populations around your house. Δ

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Ask Jackie

“Rescuing” sugar, making beet sugar, is pigweed poisonous?, “big” animals when they die, and growing “spelt”

Help! I stored sugar, both white and brown, for the the Y2K and now I have 2 and 10-pound rock hard lumps, instead of usable sugar. Should I just feed the sugar to the goats, or would it hurt them? Gee, I hate to waste all that sugar and money. Is there any saving it?

Donna Beckman
Cascade, MT

Whoa! Save that sugar. Unfortunately, sometimes stored sugar does get hard, due to humidity or other moisture. But all is not lost. For the brown sugar, which I assume is still in plastic bags, wrap two heavy paper bags around the plastic bags and rap the lump a few times with a good hammer. That will break up the, huge lump into smaller lumps. Pour them out into a gallon glass jar. Now take a sheet of paper towel or a wash cloth and wet it, squeezing out all excess moisture. Place this on top of the lumpy sugar and screw down the lid. In a few days the entire jar will be soft and nice again. I use this all the time. An apple, sliced in half, will also work, but I've noticed an apple flavor in the brown sugar that is not always appreciated, depending on what you're using it for. I prefer the damp paper towel or washcloth. (Do not use a washcloth if you use dryer sheets or scented fabric softener, though.)

As for the 10-pound rock sugar, likewise place the sugar sack into two heavy paper bags and roll the top shut. Then take your trusty hammer and whack the lump a few times. White sugar frees up much quicker

and better than brown. Now take a rolling pin and work the lumps still in the bag, 'til it is mostly free-flowing. Run the sugar through a sieve catching any remaining lumps. Put those back into the paper sack and roll them a bit more with the rolling pin. Voilà! You've saved an entire sack of rock hard sugar and a bunch of money.

By the way, this will also work for rock hard salt, too.

Jackie

Better late than never! Back in the Jan/Feb (2002) issue of BHM, you answered a reader's question about processing sugar beets into sugar in the negative, saying, in effect, that it is a factory only process, and can't be done at home.

Enclosed is a copy of a process to extract sugar from sugar beets at home. As you can see, we got this from R.H. Shumway, the catalog seed people. They sent it on request if you bought sugar beet seeds from them. To be honest, we have never run the process to the point of crystal sugar, although I see no reason why it wouldn't work.

I always wonder why Shumway is not mentioned more as a supplier by gardening authors. Maybe they're too down to earth.

Michael E. Rapp
Reading, PA

No, Shumway is definitely not “too down to earth” for me. It's simply that there are so many good seed companies out there that we can't mention them all. (Although that



Jackie Clay

might be a good idea.) The reason I don't buy too many seeds from Shumway is that many of their seeds require a longer growing season than I have. They are a great company, with lots of good old time seeds at reasonable prices.

Now, as to the sugar refining process, I should have said that refining sugar at home is not feasible to most people as it requires much, much “dinking around,” and the end results are not much crystalized sugar for a whole lot of work. My older kids did this one year as a family project. They used sugar beets that they found on the roadside that had dumped off of sugar beet trucks being hauled to the sugar plant. They didn't get enough crystalized sugar to sweeten a batch of Kool-Aid.

If any readers have lots of sugar beets which are very productive in the garden and lots of time, you can refine sugar at home. But don't expect it to be like “store sugar.”

Jackie

I have been enjoying your magazine for some time now and I do not normally write unless I have deep concerns about articles I have read. I guess this is one of those times. “Harvesting the wild greens” at first

seemed like a harmless article on an assortment of greens that I might be willing to try. I decided to look up some of the weeds on the Internet (Redroot Pigweed) and come to find out that that particular plant was very toxic and your article made no mention of that. I do hope that the person that wrote the article is still alive. I would think that you would do your homework and check validity of a story before publishing it.

Jason Meyer
Jason.Meyer@ci.hayward.ca.us

Gee Jason, I am certainly very alive, and so is my entire family. And we've been eating pigweed for years and years. Among experienced wild foragers, including centuries of Native Americans, pigweed is considered an excellent food source. And very tasty. I do not write about things I research or have just "heard about." I only write about how our family lives. I do not experiment on my family's health. Everything we eat is well researched and documented. Let me quote one recent source, *Edible and Medicinal Plants of Minnesota and Wisconsin*, by noted herbalist and author, Matthew Alfs, M.H. Under the heading of **Pigweed** (Green Amaranth; Red Amaranth; Rough Pigweed; Redroot Pigweed; Wild Beet) (*Amaranthus retroflexus*) you will find the following quote follows his description of the various foods pigweed provides (leaves, seeds): "Although pigweed is revered as a wild food, its medicinal applications have been little known. These, however are many and mighty."

Many survival books speak highly of amaranth or pigweed, including *Outdoor Survival Skills* by Larry Dean Olsen. And then Native Seeds/SEARCH says the following in their catalog: "All amaranth leaves can be eaten as raw or cooked greens when small, but some are more palatable. Cleaned seeds can be cooked whole as a hot cereal or ground finely

in a mill or blender and added to your favorite recipe."

This does not sound like a "very toxic" plant. One caution, however, is appropriate with pigweed and many other greens including some we grow in our own garden such as spinach. One should not harvest loads of the plant in areas where there is heavy agricultural use, as it will accumulate potentially dangerous amounts of nitrates, in the same way many domestic plants do. Now eating one meal of even this pigweed will likely do no harm, but I certainly would not advise eating bushels of it, nor would I recommend eating a diet solely of pigweed from agricultural lands either. (Many water wells in such land have been contaminated with heavy nitrate deposits as well. One would certainly not advise a whole-sale caution on drinking water because of it.)

Jackie

I would like to keep a couple horses and cows, but have never had large animals before. What do you do when they die? Is there an established way to remove the carcass? Do you just pick a quiet corner of your property and bring in a bulldozer? I have heard vaguely that some people will call canning factories for dog food or some such.

Rose K.
Albuquerque, NM

Death is a fact of life for us all. Fortunately, very few animals die on the farm. Usually one sells an older cow, or a person sells an older horse to buy a younger one before they are beyond use. Of course, some of us old softies keep favorite animals until they die. We just recently lost our old Morgan stallion at age 25. While in many places, you can simply call a rendering plant which renders dead livestock down into fertilizer and soap fat among other things, we feel that our big "pets" deserve better. A

friend brought over a backhoe, and in ten minutes dug a nice deep grave for our old friend and that was that. He even put up the wood cross that our son, David, made for the horse that taught him to ride.

Farmers with large acreages and living in areas free of restrictions usually just drag dead livestock out into the woods and let nature take its course. (Assuming that the animal did not die of a disease that could be contagious.)

Jackie

I have been newly introduced to an old grain—spelt. Because of a wheat allergy, I am finding this grain of great interest. Do you have any ideas on how to grow spelt or any good recipes that come to mind? Thank you for your kindness.

Vince Williams
jacind@swbell.net

I'd be cautious in using spelt, as it is an old variety of wheat that was primarily used for livestock feed and it is a bit hard to thresh out effectively. It is grown and used almost like wheat, but it will be coarser when ground as there will often be bits of chaff that do not winnow out when it is cleaned. One of the first grains I helped plant was spelt. I thought they said "smelt" and wondered why anyone would plant fish all over a 40 acre field.

Have you tried some of the alternative flour grains? I use a lot of cornmeal, masa (corn flour), rice flour, amaranth, oat, quinoa, and others for fun, taste, and variety. We like flat breads made of these grains just about as much as we do a nicely browned loaf of fresh wheat bread. And we have no wheat allergies.

Jackie

Want more Jackie?

Go to:

www.backwoodshome.com

Letters

(Dear Readers - Thank you for writing to Backwoods Home Magazine. The opinions and suggestions we receive from our readers are very important to us. We regret that we are no longer able to print or individually respond to every letter received due to the volume. We do read every letter received, and pass them along to the editor or writer concerned. We print a selection from our mail that best represents the views and concerns of our readers.

— The Editors)

Emergency Preparedness and Survival Guide

Jackie, I love your articles in Backwoods Home. I've been on the survival kick for the last 20 years and you speak my language.

I have the "Emergency Preparedness and Survival Guide" and it's a fabulous little book. Everybody should have one and I've sent several copies as gifts.

I was so glad to hear you talk about food not spoiling for years. I agree. I have lots of wheat, beans, rice, etc. that I fully expect to be good when I open them.

We, my two daughters, one son-in-law and myself moved to the Ozarks nine years ago from California. We have 170 acres of woods, pasture, and a river. We run a canoe business mainly from Memorial Day to Labor Day. I love it here (I was originally from Kansas) after 40 years in California.

I have never bought food in #10 cans and after reading about your year's supply of food for the family, I realize I need #10 cans of dry milk, cheese powder, and eggs.

I have lots of cases of canned vegetables. I'm too old (83 years and handicapped) to do any canning anymore. I do have lots of food I dried several years ago and I keep buying every week to add to our supply.

I feel sure that the bottom will fall out one of these months and we'll be dependent on our stored food.

Your articles are the ones I read first when Backwoods Home arrives.

I can't use your CD-Rom because I don't have a CD player. I've only gotten a TV since 9-11. I hate the thing but I do watch the news now and Oprah. She's a shining light in this world.

Keep on giving us all your wonderful info. I admire your bravery in living so far in the wilderness, I live vicariously through you.

Esther Young
Caulfield, MO

Anthologies/website

Thank you so much for the anthologies you have put out. I have the first 8 and now am ordering the 9th. I hope finances are such that I can order #10 next month.

If you put out a #11 I will order it too if I can afford it.

These books (anthologies) are great. The wife and I read a lot of stories in them when there is nothing on TV or we don't have work to do. She is handicapped so she gets more reading time in. Thank you again.

Robert Kager
Mt. Vernon, WA

You make my day! Thanks so much for all the wonderful work you do on our behalf. I found you about three years ago and have been enjoying every bit of each magazine since. Now I also have five anthologies and take them everywhere with me to read when I have a moment or two. I have learned so much about being self-reliant and living a really fulfilling lifestyle. Who would have thought you could teach so much to an old retired couple!

My regrets are twofold; wish you were published each month as I just can't get enough, and wish we had found you in the very beginning. I'm really sorry we weren't on board at the very beginning. Another joy is

the BH Forum (www.backwoodshome.com). I've met some splendid people and not only learned from them but also have been able to share from my store of information. This is very satisfying.

Deanna Juhl
gmadear@neotek.net

Guns Save Lives

In your article about the book "Guns Save Lives" you mentioned the fact that many acts where guns save lives go unreported every year and reported acts go unmentioned in the news. I have an idea for an article that I would like for you to pass around your staff.

Perhaps we need a new gun law. This law would require police to keep records on crimes that are prevented or stopped by gun owners. The law would also require public publishing of such data on a quarterly basis. If a citizen called in or otherwise reported a foiled crime, the police would be required to validate and document the act.

Such a law would give us solid statistics on how much crime gun owners prevent each year.

"massey3j"
massey3@cox.net

Thanks

I just wanted to send you a quick note to let you know how much I enjoy your magazine. I am a resident of Calgary Alberta, Canada, and started reading your publication about two years ago. My wife and I were in a drugstore in a small town about 30 minutes west of Calgary picking up some odds and ends when she noticed your magazine. Since accidentally discovering Backwoods Home, it has become our favorite magazine and we look forward to each new issue. I can honestly say that Backwoods Home is the first magazine I have ever bothered to read cover-to-cover, including all the ads!

Since discovering your terrific magazine, I have recommended it to many like-minded friends who have also become devoted fans! I always knew there must be others like myself out there, somewhere, who believe in personal freedom, self sufficiency and the pursuit of a life free from "Big Brother's" constant intrusions. Here in Canada, people who believe as I believe, are few and far between. Thanks for publishing a magazine that lets people like us connect and know that despite having to live in a society that seems more and more deviant by the passing day, there are still decent, normal, conservative people out there who are not afraid to put common sense into print!

Stephen Kerridge
Calgary Alberta, Canada

Just read Jan/Feb 2003 again! Probably for the third time, and I just got it yesterday.

Are ya'll mind readers? Dave Duffy is right on the money.

Jackie Clay, I'd gladly do your grunt work, just to hang out with ya'll.

I think this is the best magazine I have ever received. Without naming names, the others pale in comparison, although I still receive a few. BHM is always packed with good info. I'm really glad that ya'll took over.

Well anyway, I hope ya'll enjoy putting out such a great magazine as much as I like reading it.

David Hill
Caldwell, TX

This is a letter I have anticipated writing for many years now. My term of incarceration will soon be over and I ask that you change my address in your records so your wonderful and very useful magazine will continue to find its way into my hands.

Before I close I want to applaud your recent decision to continue to accept subscriptions from those of us who have made bad decisions in our lives and ended up as members of Big

Brother's growing community of felons. I've been a subscriber for hmm, about seven years now and couldn't begin to tell you how valuable your magazine has been towards my future. I've a small 50 acre place in southeastern Tennessee that is covered with hardwood trees, has a running creek, lots of deer and turkey, and I'll utilize many of the articles from Backwoods Home as I clear land, put in my power system, plant my gardens and fruit orchard, build my barn, and acquire livestock. Of course, after ten years of incarceration I'll be looking for someone to assist me in all my endeavors and grow old with. Guess I just may be sending in a personal ad in the near future. I've found that the kind of folks I want to know and associate with all read your magazine. Thanks for helping get me through the hard times and for the help you will provide in the future too.

Rocky McFarlin
Dayton, TX

Cancel my subscription

I just finished reading the article by Claire Wolfe in the number 80 edition of Backwoods Home Magazine. I have never read such a stinking piece of dog dung in my life. How can you print this piece in your magazine by this Tijuana burn out. I really can't believe it.

Please cancel my subscription now, don't ever send me your warped rag to my home again.

Frank E. Herout
Downers Grove, IL

City vs country

Just found your website today, and truly enjoyed it. I live in the DC area with my husband and four children and I agree in most part with your comparison of the big city vs. country living. Very fair and accurate. However, you never touched on one of the most important aspects in a decision such as that...education.

I teach public High School and am just miles off the DC line. The average SAT score here is 1100 and 97% go on to college. While looking to move out to the country to give our kids a more peaceful life, I started comparing those statistics, along with the types of classes offered, computer labs, etc. The farther I got away from the city, the lower the SAT scores and the lower the percentage of children going to college.

Also, one has to consider retirement. In the big city, you have big companies, established, that can provide a retirement after 30 years. of service. In the country, these types of opportunities are few and far between, meaning there is a greater chance you'll be working for all of your life.

Just my thoughts. I'd love to hear yours on those two subjects-

Diane Moore
dmoore80@yahoo.com

Colin Powell editorial

Your "My view" in issue #79 was just perfect. It prompted me to view other editorials on the website.

It is easy to get the impression that Backwoods Home is a "red neck" type magazine. Thoughtless, knee jerk, ignorant sort of publication.

Oh contraire...as Miss Piggy would say. Your editorials give the lie to that. I love them. It said all that needs to be said. And gives me hope that all is not lost for this country. We need more thoughtful people to speak up. And we need more people to see that folks in the country are not just a bunch of "yahoos."

The question remains...how do we get the general public, especially in NYC, to see that...I have sent your comments on to friends. Maybe they will see that rationality still reigns in backwoods country.

MacDale1st@aol.com

The last word

Is television still a wasteland?

"...sit down in front of your television set when your station goes on the air...and keep your eyes glued to that set until the station signs off. I can assure you that you will observe a vast wasteland." Newton Minnow, former Chairman of the FCC in a speech to the National Association of Broadcasters, May 9, 1961.

I own a TV. But, other than to watch an occasional rented movie, I hadn't turned it on in years. I mean many years. There was no reason to. I didn't have cable, or a satellite dish, or even a TV antenna. (Do antennas even work anymore?) It wasn't that I was too broke to afford cable. I just agreed with Newton Minnow, that television is a wasteland—though I didn't think it was a government function to make it "better." Some friends told me I was better off without it. But there were a few others who said I was missing stuff—good stuff.

Good stuff on TV? No way. I'd seen it and it stunk.

Then I moved into a new place and the landlord mentioned there was still a live cable hookup. And because it was the minimum set up—no box or anything, there was no telling when they'd get around to turning it off, so I had cable until they did. Thus it was that one fateful night I decided to hook it up and...

...the first thing I noticed, after many years away, is that many of the commercials are actually pretty good. I know I never felt that way before. But now, I realized, a lot of thought goes into making them. More, it seems, than goes into most of the programs. I guess it makes sense when you think about it. They've got to grab your attention when you want to head for the refrigerator or take a bathroom break, and they've got to keep your attention even though you're going to see them again and again. That's what makes them both effective and irritating, their relentless repetition.

The next thing I noticed was the number of channels. I'd heard talk about them. There are hundreds. And that's where it gets interesting. I still thought of TV as ABC, NBC, CBS, and PBS, with a few local stations thrown in.

Not now. Suddenly, there's the *History Channel*, *History International*, the *Science Channel*, *Discovery Wings*...The list goes on. The first two weeks I found myself, night after night, sitting slack-jawed in front of the TV. There are things on TV I didn't even know existed.

I saw a program about the history of advertising, a documentary on Henry Ford, the history of concrete (that's right, concrete, and I'll bet you didn't know how important that bland grey stuff is to civilization), the arch—from ancient times to the present, the history and construction of

forts, levers (another discovery civilization couldn't exist without), chain gangs (they're coming back), Ivan the Terrible (he deserved the moniker), the Boer War, the Roman Empire, Greek civilization, a detailed explanation of the Seven Wonders of the Ancient World—what they were, where they were, who built them, their fates, etc.

On the *XY Factor* I watched a documentary on the treatment of French women, following the liberation of France during WWII, who were suspected of "consorting" with the Germans. It bothered me because I hate to see women mistreated for any reason. Then I reminded myself these were the French, the same people who beheaded Lavoisier, arguably the greatest chemist of all time, only because he was a landlord. I shrugged.

I find I have to filter out propagandist points of view, both left and right, from some programs. Still, the information and analysis are priceless and it's often prompted me to go out on the Net to pursue subjects further, and I've even ordered books to follow up on some subjects.

And *Animal Planet*, did I tell you about *Animal Planet*? One program after another on animals: bats (did you know that until the advent of man, bats were the *only* mammals indigenous to New Zealand?), tarantulas (did you know there are tarantulas big enough to feed on mice?), Arctic wildlife (do you know how polar bears catch seals?).

Other than watching the Super Bowl and one episode of *The Simpsons* I haven't watched network television. I've never seen a "reality" show (the true reality shows are on the *History Channel*, *Discovery Wings*, et al.). ABC, CBS, and NBC are, as near as I can tell, still the wasteland Minnow spoke of. I don't know what he thinks of television today, but anyone with access to cable who can't get an education—that's entertaining—is spending too much time watching sitcoms, sports shows, game shows, etc. Best of all, there's no tuition—other than cable costs, and no homework, no exams. You just have to endure the ads.

Where do they come from? A lot of these programs are produced here while others are from the UK, Canada, New Zealand, and Australia. Otherwise, I don't know who funds them or what inspires (or possesses) someone to make them. But I'm ever so grateful. PBS cries for government funding lest educational TV go away, but these channels don't need government funding. And PBS isn't nearly as good as the *History Channel*.

It's a huge, fascinating planet—it's a marvelous universe—and someone's out there shooting it with a camera and adding narration to it.

Anyone who says television is a wasteland today either doesn't have cable or is simply too lazy to surf through the channels to where the real excitement and the interesting stories are. Not getting an education from it is like spending four years at a college boozing, partying, and sleeping late, then wondering why you never learned anything. Δ

— John Silveira